United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
the Dickson County Board
of Commissioners, the
Tennessee Agricultural
Experiment Station, and
the Tennessee Department
of Agriculture

Soil Survey of Dickson County, Tennessee

How to Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

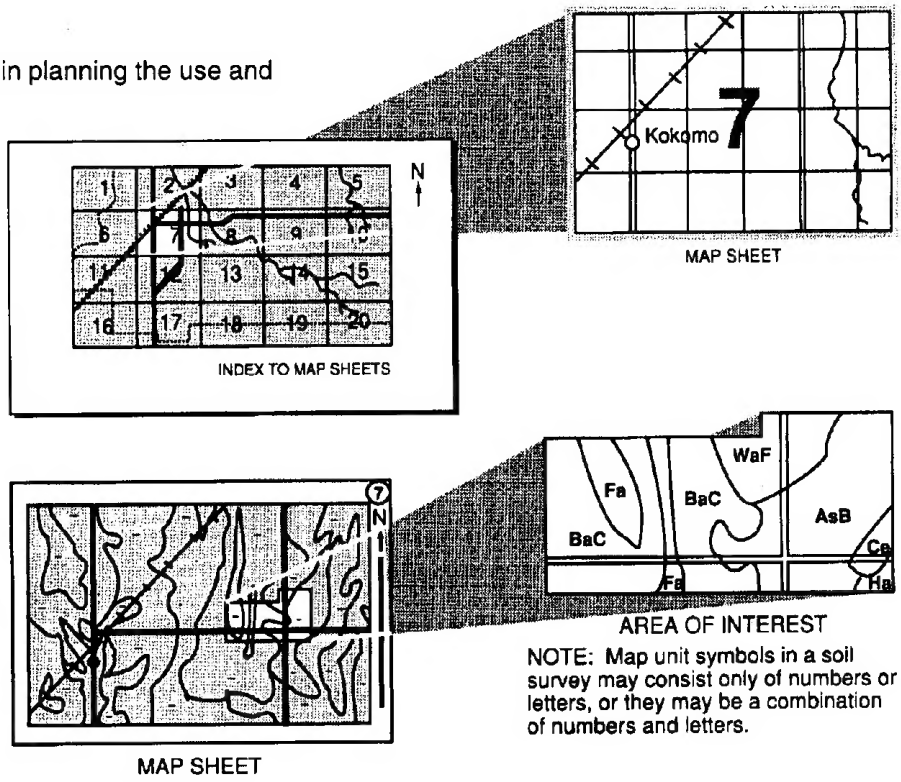
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1991. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1992. This survey was made cooperatively by the Natural Resources Conservation Service and the Dickson County Board of Commissioners, the Tennessee Agricultural Experiment Station, and the Tennessee Department of Agriculture. The survey is part of the technical assistance furnished to the Dickson County Soil Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Dark-fired tobacco, foreground, and fescue-ladino hay, background. These are two of the important agronomic crops grown on the Armour-Humphreys-Sullivan general soil map unit.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

The soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

James W. Ford
State Conservationist
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Soil Survey of Dickson County, Tennessee

By Johnson C. Jenkins, Natural Resources Conservation Service

Fieldwork by Johnson C. Jenkins, David C. McMillen, Jesse F. Campbell, and David W. Thomas, Natural Resources Conservation Service; and Andy O. Gallagher, Dickson County Soil Conservation District

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Dickson County Board of Commissioners, Tennessee Agricultural Experiment Station, and Tennessee Department of Agriculture

DICKSON COUNTY is in the north-central part of Tennessee (fig. 1). It is bounded on the north by Montgomery and Cheatham Counties, on the east by Cheatham and Williamson Counties, on the south by Hickman County, and on the west by Humphreys and Houston Counties. According to the 1990 Census, the population of the county was 35,061. The city of Charlotte, the geographical center of the county, is the county seat. The county takes in 314,600 acres, or about 486 square miles.

The economy of Dickson County consists of farming, industry, retail sales, and real estate. Beef cattle and dark-fired tobacco are the main agricultural commodities. Other crops grown are corn, wheat, milo, and soybeans. The industrial workforce is large. Retail sales of goods and services are also important to both the economy and growth. Recently, real estate sales and development have been increasing.

This soil survey updates the survey of Dickson County, Tennessee, published in 1926 (*5*). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section gives general information about history and development, industry and transportation, physiography and drainage, and climate of Dickson County.

History and Development

The area now called Dickson County was first settled in 1793, when the State of North Carolina granted a large tract of land to Robert Bell, whose family settled along Jones Creek. Dickson County was named in honor of Dr. William Dickson. A Nashville physician, Dickson served as speaker of the State House of Representatives from 1799 to 1801. Later, he was elected to the U.S. Congress (*3, 6*).

Dickson county was established by act of the General Assembly of the Tennessee Legislature on October 3, 1803.

Industry and Transportation

Industries within Dickson County include manufacturing, agriculture, construction, transportation, communications, wholesale and retail trades, and public services.

The highway system in Dickson County includes four State and two Federal highways, one of which is Interstate 40. A network of county, State, and Federal highways accesses every part of the county and enables easy movement of farm products and freight. The Cumberland River, an important waterway, runs through Dickson County. Nashville is the nearest port facility. A railroad provides access to many industries in the county. A bus line and freight carriers also serve the county. The Dickson County Airport has mainly

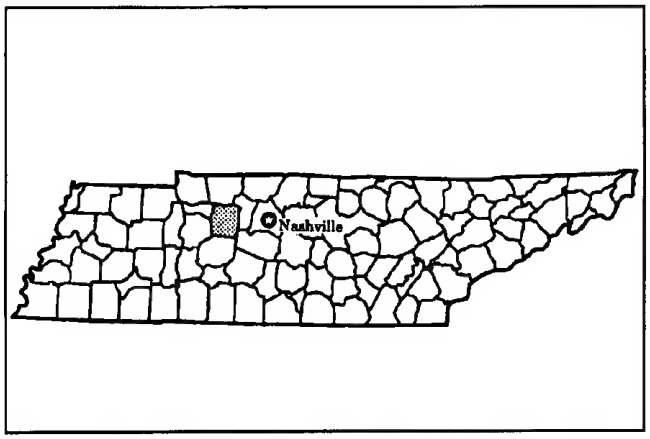

Figure 1.—Location of Dickson County in Tennessee.

commuter service. Nashville International Airport is the nearest commercial airport.

Physiography and Drainage

Regarding physiography, Dickson County is located in the Western Highland Rim of Tennessee. The soils formed in limestone, siltstone, loess (windblown silt), gravelly riverine and marine sediments, and alluvium.

The eastern part of the county consists of narrow, rolling ridges adjacent to steep hillsides. It is highly dissected by narrow drainageways. The soils on uplands are well drained and somewhat excessively drained. Long, narrow flood plains and rolling to nearly level stream terraces border the Harpeth and Cumberland Rivers. The soils in these areas range from well drained to poorly drained.

The central part of the county consists of undulating to rolling ridgetops adjoining steep hillsides. The soils on uplands are dominantly well drained and moderately well drained. In several areas nearly level to gently sloping flats collect runoff from adjacent ridges, drainage patterns are indistinct, and drainage is imperfect. Several large, perennial streams and numerous intermittent drainageways dissect the uplands in this part of the county. These drainage systems have nearly level to gently sloping stream terraces and narrow flood plains. The soils are well drained to somewhat poorly drained.

The western part of the county also consists of undulating ridgetops bordering steep hillsides. The soils on upland ridges are dominantly moderately well drained and well drained. The soils on steep side slopes are well drained. Yellow Creek and Garner Branch, both large and perennial, drain this part of the county. The drainage areas consist of nearly level to rolling stream terraces and narrow flood plains. The soils are dominantly well drained.

Drainage in Dickson County consists primarily of a series of interconnecting tributaries of major rivers. The northern and eastern parts of Dickson County are drained by the Cumberland and Harpeth Rivers and their major tributaries. The Cumberland River flows northwest along the northeastern edge of the county. Flow on these rivers is controlled by a series of hydroelectric dams built by the Tennessee Valley Authority. It normally is moderate to sluggish, except in winter and early spring, when it can be moderately rapid. The Harpeth River flows from south to north along the eastern edge of the county. Flow is moderately rapid most of the year, except in dry periods in summer, when it becomes moderate. The western half of the county is drained by three major tributary streams; Yellow Creek, Garner Creek, and Piney River. Yellow Creek flows northwest and eventually joins the Cumberland River. Garner Creek and Piney River flow south through the southwestern part of Dickson County. They eventually merge in Hickman County and join the Duck River.

Flood plains in the county are long and narrow. Stream terraces are along most of their lengths. Flood plains and low stream terraces are subject to occasional flooding during periods of heavy rainfall in winter and early spring.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Dickson, Tennessee, in the period 1957 to 1987. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 39 degrees F and the average daily minimum temperature is 30 degrees. The lowest temperature on record, which occurred on January 21, 1985, is -23 degrees. In summer, the average temperature is 77 degrees and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred on July 27, 1952, is 109 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly

accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 52 inches. Of this, 25 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 21 inches. The heaviest 1-day rainfall during the period of record was 7.05 inches on August 11, 1970. Thunderstorms occur on about 54 days each year, and most occur in summer.

The average seasonal snowfall is about 9 inches. The greatest snow depth at any one time during the period of record was 12 inches. On the average, 4 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material generally is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels

of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

1. Sengtown

Rolling to steep, well drained soils formed in residuum derived from limestone; on uplands

The soils in this map unit are dominant in most areas of the county. They are on rolling ridgetops, on hilly or steep side slopes, and in narrow valleys (fig. 2).

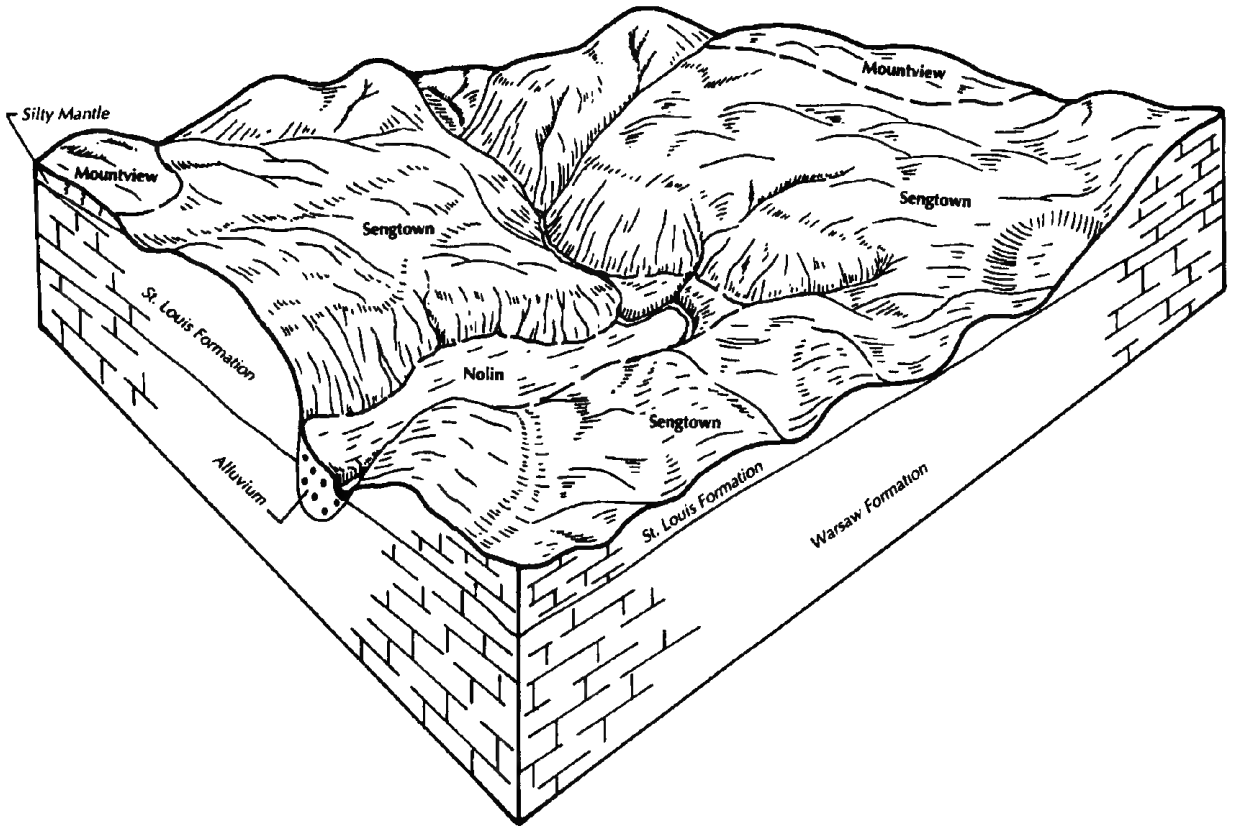

Figure 2.—The relationship of soils, landscape, and parent material in the Sengtown general soil map unit.

Generally, in the narrow valleys, streams tend to flow on the side of the valley with the steeper hillsides. In several areas sinkholes are common. These soils are underlain by limestone. A few perennial streams and many intermittent streams dissect the uplands.

This map unit makes up about 63.3 percent of the survey area. It is about 77 percent Sengtown soils and 23 percent soils of minor extent.

Sengtown soils are well drained and have a gravelly clay subsoil. They are on narrow, rolling ridgetops and on hilly or steep side slopes. Some steep areas that border perennial drainageways have rock outcrops on the lower slopes. Slopes range from 5 to 60 percent.

Of minor extent in this map unit are Mountview, Minvale, Armour, Humphreys, Lindell, Nolin, and Sullivan soils. Mountview soils are on ridgetops. Minvale soils are on foot slopes. Armour and Humphreys soils are on stream terraces. Lindell, Nolin, and Sullivan soils are on narrow flood plains.

On the smoother, less rolling hilltops the soils in this map unit are suited to row crops if erosion is controlled. Conservation tillage systems, such as no-till and contour stripcropping, help to control erosion and to maintain productivity.

On most ridgetops and on the gentler hillsides these soils are well suited to pasture and hay. Such forage crops as fescue and white clover grow well and produce good yields.

These soils are well suited to trees. Most locally adapted hardwoods grow well on these soils. Slope, the hazard of erosion, and plant competition are the main limitations.

Sengtown soils are moderately suited to residential and commercial uses. Permeability in the subsoil, slope, and low strength are limitations.

2. Hawthorne-Sengtown-Sulphura

Rolling to steep, somewhat excessively drained and well drained soils formed in residuum derived from siltstone, limestone, and shale; on dissected uplands

The soils in this map unit are in the eastern part of the county. They are on narrow rolling ridges, steep and very steep hillsides, and narrow valleys (fig. 3). Nearly vertical rock bluffs are common along major streams and rivers. The soils formed in interbedded siltstone, limestone, and shale. A few perennial streams drain the larger valleys. Many intermittent streams dissect uplands.

This map unit makes up about 20 percent of the survey area. It is about 35 percent Hawthorne soils, 32 percent Sengtown soils, 16 percent Sulphura soils, and 17 percent soils of minor extent.

Hawthorne soils are somewhat excessively drained, have a loamy subsoil, and are moderately deep to soft bedrock. They are on narrow, rolling hilltops and are intermingled with Sulphura soils on steep hillsides. Slopes range from 5 to 60 percent.

Sengtown soils are well drained, have a gravelly clay subsoil, and are on narrow, rolling hilltops above Hawthorne soils. Slopes range from 5 to 12 percent.

Sulphura soils are somewhat excessively drained, have a loamy subsoil, and are moderately deep to hard bedrock. They are on the lower third of steep hillsides below Hawthorne soils. Slopes range from 20 to 60 percent.

Of minor extent in this map unit are Sugargrove, Tarklin, Byler, Minvale, Sullivan, and Lindell soils. Sugargrove soils are on narrow, rolling ridgetops. Tarklin and Byler soils are on stream terraces. Minvale soils are on rolling footslopes. Sullivan and Lindell soils are on narrow flood plains.

On rolling ridgetops Sengtown soils are suited to row crops. Because these areas of Sengtown soils are small and irregular in shape, they are difficult to manage and generally isolated. In most areas the soils in this unit are unsuited to row crops because of slope, low available water capacity, and depth to rock.

On rolling ridgetops Sengtown soils are well suited to pasture and hay. Such forage crops as fescue and white clover grow well and produce good yields.

These soils are suited to trees. Most locally adapted hardwoods grow well on Sengtown soils. Drought-tolerant species are suited to Hawthorne and Sulphura soils, which tend to be droughty. Site preparation and aspect are important in establishing and maintaining productive timber stands.

In most areas these soils are poorly suited to residential and commercial uses. In less sloping areas Sengtown soils are moderately suited to building site development; however, Hawthorne and Sulphura soils are poorly suited because of slope and depth to rock.

3. Saffell-Lax

Rolling to steep, well drained and moderately well drained soils formed in mixed gravelly marine sediments and loess; on uplands

The soils in this map unit are on the southwestern edge of the county. They are on undulating to rolling ridgetops, on steep hillsides, and in narrow valleys (fig. 4). Most valleys have low stream terraces and narrow flood plains. Ridgetops are covered by a thin mantle of silty material about 2 feet thick over a gravelly fragipan. On hillsides mixed, rounded gravel and loamy soil material range from 2 to 6 feet or more in thickness. A few perennial streams drain the larger valleys. Many intermittent streams dissect uplands.

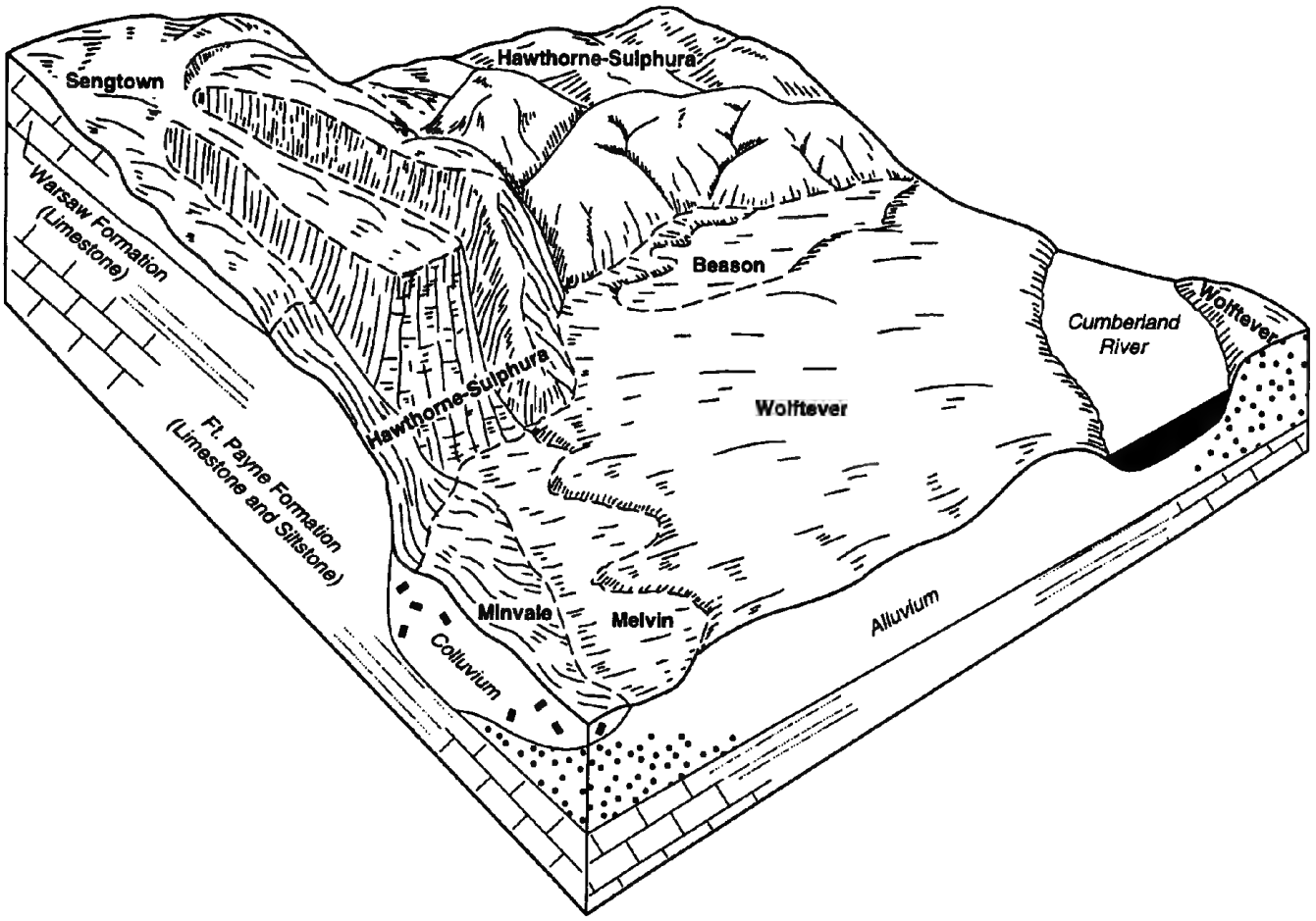

Figure 3.—The relationship of soils, landscape, and parent material in the Hawthorne-Sulphura-Sengtown and the Wolftever-Beason-Melvin general soil map units.

This map unit makes up about 10 percent of the survey area. It is about 39 percent Saffell soils, 37 percent Lax soils, and 24 percent soils of minor extent.

Saffell soils are well drained and have a loamy subsoil. They are on hilly and steep upland hillsides. Slopes range from 12 to 60 percent.

Lax soils are moderately well drained. They have a dense, gravelly fragipan in the subsoil. They are on broad, undulating and rolling ridgetops on uplands. Slopes range from 2 to 12 percent.

Of minor extent in this map unit are Humphreys and Sengtown soils. Humphreys soils are on stream terraces. Sengtown soils are on steep hillsides adjacent to major streams.

Undulating ridgetops and narrow stream terraces in this unit are suited to row crops if erosion is controlled. Such conservation tillage systems as no-till and contour stripcropping help to control erosion and to maintain productivity on both sloping uplands and stream terraces. On low stream terraces planting crops later in the season will reduce the hazard of flood damage.

On rolling ridgetops Lax soils are well suited to pasture and hay. Such forage crops as fescue and white clover grow well and produce good yields on these soils. On steep hillsides Saffell soils are droughty and are difficult to manage for pasture.

On the gentler slopes, Lax and Saffell soils are suited to trees. However, they are droughty; on these soils drought-tolerant tree species should be planted. Planting trees on north- or east-facing slopes is important in establishing and maintaining productive timber stands.

In most areas the soils of this unit are poorly suited to residential and commercial use. Lax and Saffell soils are poorly suited to both building site development and septic tank absorption fields because of slope, permeability, and wetness.

4. Sengtown-Mountview-Dickson

Undulating to rolling, well drained and moderately well drained soils formed in loess and limestone residuum; on uplands

The soils in this map unit are in the central and southern parts of the county. They are on undulating plains and rolling ridgetops. They are underlain by limestone. In several areas surface water stands for several days in slightly concave depressions. A few intermittent streams dissect uplands.

This map unit makes up about 5 percent of the survey area. It is about 38 percent Sengtown soils, 32 Mountview percent soils, 28 percent Dickson soils, and 2 percent soils of minor extent.

Sengtown soils are well drained and have a gravelly clay subsoil. They are on narrow, rolling ridgetops and on hillsides. Slopes range from 5 to 20 percent.

Mountview soils are well drained. They have a silty mantle about 22 to 24 inches thick overlying a clayey subsoil. They are on undulating and rolling ridgetops. Slopes range from 2 to 12 percent.

Dickson soils are moderately well drained. They have a compact, slowly permeable fragipan in the subsoil. They are on broad, undulating ridges. Slopes range from 2 to 5 percent.

Of minor extent in this map unit are Guthrie and Lax soils. Guthrie soils are in slightly concave depressions. Lax soils are on slightly higher, convex knobs.

On undulating ridgetops and gentler hillsides Dickson and Mountview soils are well suited to row crops if erosion is controlled. Such conservation tillage systems as no-till and contour stripcropping help to control erosion and to maintain productivity.

In most areas the soils of this map unit are well suited to pasture and hay. Forage crops such as fescue and white clover grow well and produce good yields.

These soils are well suited to trees. Most locally adapted hardwoods grow well on these soils. Slope, the hazard of erosion, and plant competition are limitations to growing trees. Forestry operations are best suited to summer and fall.

Sengtown and Mountview soils are suited to residential and commercial use. Dickson soils are poorly suited to septic tank absorption fields because of wetness and slow permeability in the fragipan.

5. Wolftever-Beason-Melvin

Nearly level, moderately well drained to poorly drained soils formed in alluvium; on low terraces and flood plains of the Cumberland River

The soils in this map unit are on nearly level stream terraces and flood plains of the Cumberland River (fig. 3). They formed in clayey and loamy alluvium of the Cumberland River. A perennial stream and several intermittent drainageways dissect the unit.

This map unit makes up about 0.3 percent of the survey area. It is about 32 percent Wolftever soils, 14 percent Beason soils, 12 percent Melvin soils, and 42 percent soils of minor extent.

Wolftever soils are moderately well drained, have a clayey subsoil, and are in slightly higher positions on stream terraces. Slopes range from 0 to 2 percent.

Beason soils are somewhat poorly drained, have a clayey subsoil, and are on nearly level stream terraces. Slopes range from 0 to 2 percent.

Melvin soils are poorly drained, have a loamy subsoil, and are on flood plains. Slopes range from 0 to 2 percent.

Of minor extent in this map unit are Nolin, Sullivan, Minvale, and Byler soils. Nolin and Sullivan soils are in narrow strips adjacent to channels of the Cumberland and Harpeth Rivers. Minvale soils are on footslopes adjacent to steep hillsides. Byler soils are on sloping stream terraces.

Wolftever and Beason soils, which are subject to occasional flooding, are suited to such late season row crops as soybeans and grain sorghum. Melvin soils are unsuited to row crops because of wetness and flooding. In most areas Melvin soils are used by the Tennessee Wildlife Resources Agency as habitat for wetland wildlife and migratory waterfowl.

Wolftever and Beason soils are suited to pasture and hay. Such forage crops as fescue and white clover grow well, produce good yields, and can tolerate short periods of wetness.

The soils in this unit are suited to trees. Most locally adapted bottom land hardwoods grow well on these soils. Flooding and seasonal wetness are some limitations for growing trees. Forestry operations are best suited to summer and fall.

These soils are poorly suited to residential and commercial uses because of flooding, seasonal wetness, and permeability in the subsoil.

6. Armour-Humphreys-Sullivan

Nearly level to undulating, well drained soils formed in alluvium; on stream terraces and flood plains along Yellow Creek

The soils in this map unit are in the western part of the county adjacent to Yellow Creek. They are on nearly level to undulating stream terraces and narrow flood plains bordered by steep upland hillsides (fig. 4). Yellow Creek, the major drainage system, meanders in a southeasterly to northwesterly direction through the center of the unit. Many intermittent

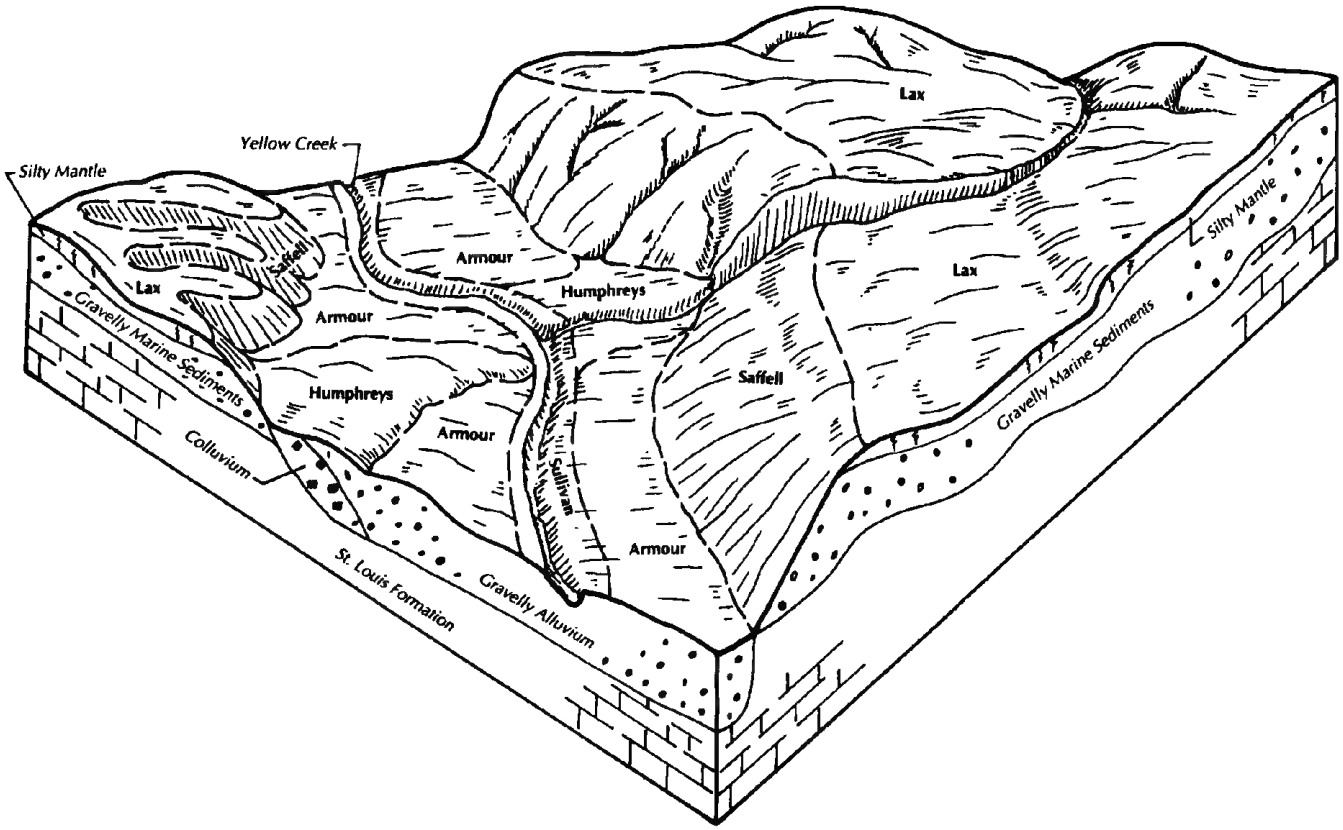

Figure 4.—The relationship of soils, landscape, and parent material in the Saffell-Lax and the Armour-Humphreys-Sullivan general soil map units.

streams flowing along narrow valleys intersect Yellow Creek.

This map unit makes up about 0.7 percent of the survey area. It is about 52 percent Armour soils, 35 percent Humphreys soils, 11 percent Sullivan soils, and 2 percent soils of minor extent.

Armour soils are well drained and have a silty subsoil over a gravelly substratum. They are on nearly level and undulating stream terraces. Slopes range from 0 to 5 percent.

Humphreys soils are well drained and have a loamy subsoil. They are on nearly level and undulating stream terraces. Slopes range from 0 to 5 percent.

Sullivan soils are well drained and have a loamy subsoil. They are on narrow flood plains along Yellow Creek. Slopes range from 0 to 2 percent.

Of minor extent in this map unit are Nolin and Lindell soils. Nolin soils are in wider areas on the Yellow Creek flood plain. Lindell soils are in narrow, slightly lower positions on flood plains of tertiary streams.

In the undulating areas Armour and Humphreys soils are well suited to row crops. Nearly level areas of this unit are suited to row crops if planted later in the season to avoid the hazard of flooding in winter and early spring.

In most areas the soils in this unit are well suited to pasture and hay. Such forage crops as fescue and white clover grow well, produce good yields, and can tolerate short periods of wetness.

These soils are well suited to trees. Most locally adapted hardwoods grow well on these soils. The hazard of flooding and plant competition are limitations for growing trees.

In undulating areas Armour and Humphreys soils are suited to most residential and commercial uses. Sullivan soils and, in nearly level areas, Armour and Humphreys soils are poorly suited to most residential and commercial uses because flooding is a hazard.

7. Byler-Nolin

Nearly level to rolling, moderately well drained and well drained soils formed in alluvium; on stream terraces and flood plains of the Harpeth River

The soils in this unit are along the eastern edge of the county adjacent to the Harpeth River. They are on

undulating and rolling stream terraces and on nearly level flood plains. The unit is adjacent to and drained by the Harpeth River.

This map unit makes up about 0.7 percent of the survey area. It is about 53 percent Byler soils, 34 percent Nolin soils, and 13 percent soils of minor extent.

Byler soils are moderately well drained. A compact, slowly permeable fragipan is in the subsoil. These soils are on stream terraces. Slopes range from 2 to 12 percent.

Nolin soils are well drained and have a silty subsoil. They are on flood plains adjacent to the Harpeth River. Slopes range from 0 to 2 percent.

Of minor extent in this map unit are Armour, Lindell, Melvin, and Tarklin soils. Armour and Tarklin soils are on stream terraces. Melvin and Lindell soils are on flood plains.

In most areas the soils in this unit are well suited to crop production. Nolin soils are well suited to row crops planted later in the season, after the hazard of flooding has diminished. On the undulating ridgetops and gentler side slopes Byler soils are suited to row crops if erosion is controlled. Such conservation tillage systems as no-till and contour stripcropping help to control erosion and to maintain productivity.

These soils are well suited to pasture and hay. Such forage crops as fescue and white clover grow well and can tolerate short periods of wetness.

Byler and Nolin soils are well suited to trees. Most locally adapted hardwoods grow well on these soils. The hazard of flooding and plant competition are limitations for growing trees. Forestry operations are best suited to summer and fall.

These soils are poorly suited to most residential and commercial uses. Nolin soils are poorly suited because of the hazard of flooding. Byler soils are poorly suited because of wetness and permeability in the subsoil.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Armour silt loam, 2 to 5 percent slopes, gravelly substratum, is a phase of the Armour series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are either complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Sengtown-Rock outcrop complex, 20 to 60 percent slopes, is an example.

An *association* is made up of two or more

geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Hawthorne-Sulphura association, steep, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop, very steep, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Soil Descriptions

ArA—Armour silt loam, 0 to 2 percent slopes, gravelly substratum, occasionally flooded

Setting

Landscape position: Low stream terraces
Shape of areas: Long and narrow
Size of areas: 5 to 100 acres
Major uses: Hay, pasture, and cropland

Typical Profile

Surface layer:
0 to 8 inches, brown silt loam
Subsoil:
8 to 28 inches, strong brown silty clay loam
28 to 46 inches, strong brown silty clay loam that has brownish mottles
46 to 60 inches, yellowish red very gravelly silty clay loam that has brownish mottles

Inclusions

- Intermingled areas of well drained Humphreys soils on stream terraces
- Small strips of well drained Sullivan soils adjacent to stream channels

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, unless the soil has been limed
Flood hazard: Occasional, for very brief periods, in winter and early spring
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
- Yields are good for most locally adapted crops (fig. 5).
- Small grain, which produces good yields, can be damaged by occasional flooding.

Suitable management practices:
- Seasonal flooding in winter and early spring is not a management limitation.

Capability class: IIw

Pasture and hay

Suitability: Well suited
General management considerations:
- Seeding only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, helps to overcome the hazard of flooding.

Suitable management practices:
- Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, and loblolly pine
General management considerations:
- The main concern in woodland management is plant competition.

Suitable management practices:
- Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability for most uses: Poorly suited
General management considerations:
- The soil is poorly suited to most residential and commercial uses because of flooding.

Suitable management practices:
- Locating dwellings, commercial structures, and roads and streets above expected flood levels will reduce the hazard of flooding.

Figure 5.—Armour silt loam, 0 to 2 percent slopes, gravelly substratum, occasionally flooded, is well suited to row crops planted later in spring.

ArB—Armour silt loam, 2 to 5 percent slopes, gravelly substratum

Setting

Landscape position: Stream terraces
Shape of areas: Irregular
Size of areas: 5 to 25 acres
Major uses: Hay, cropland, and a few areas of pasture

Typical Profile

Surface layer:
0 to 8 inches, brown silt loam
Subsoil:
8 to 28 inches, strong brown silty clay loam
28 to 46 inches, strong brown silty clay loam that has brownish mottles
46 to 60 inches, yellowish red very gravelly silty clay loam that has brownish mottles

Inclusions

- Small areas of moderately well drained Byler soils in positions slightly lower than those of the Armour soil
- Areas of moderately well drained Tarklin soils and well drained Humphreys soils on short side slopes
- Narrow strips of well drained Sullivan soils adjacent to stream channels.

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
- Most locally adapted crops can be grown and good yields can be attained.
- The soil is susceptible to erosion, which can remove valuable topsoil.

Suitable management practices:
- No-till planting, contour cultivation, and stripcropping help to control erosion and to maintain productivity.

Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• The soil has no significant limitations for forage production if erosion is controlled.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields where adequate liming, fertilization, and other management needs are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, and loblolly pine
General management considerations:
• The main concern in woodland management is plant competition.
Suitable management practices:
• Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Well suited
General management considerations:
• Low strength is a limitation for local roads and streets.
• Permeability in the subsoil is a limitation for septic tank absorption fields.
Suitable management practices:
• Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Increasing the size of septic tank absorption areas helps to compensate for restricted permeability.

ArC—Armour silt loam, 5 to 12 percent slopes

Setting

Landscape position: Stream terraces
Shape of areas: Irregular
Size of areas: 5 to 25 acres
Major uses: Hay and pasture

Typical Profile

Surface layer:
0 to 7 inches, brown silt loam
Subsoil:
7 to 20 inches, strong brown silty clay loam
20 to 36 inches, strong brown silty clay loam that has reddish mottles
36 to 60 inches, red silty clay loam that has brownish mottles

Inclusions

• Small areas of moderately well drained Byler soils in slightly lower positions
• Areas of moderately well drained Tarklin soils and well drained Humphreys soils on short side slopes
• Narrow strips of well drained Sullivan soils in lower areas adjacent to stream channels

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• The hazard of accelerated erosion by water can remove valuable topsoil and can adversely affect rooting depth.
Suitable management practices:
• Reduce the risk of water erosion and runoff by applying conservation practices, such as no-till and contour stripcropping.
• Improve and maintain tilth by using a cropping system that includes grasses, legumes, or grass-legume mixtures; rotating crops; using minimum tillage; and growing cover crops.
Capability class: IIIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Slope increases the hazard of erosion where plant stands are overgrazed or if plant stands are poor.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields where

adequate liming, fertilization, and other management needs are carried out.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, and loblolly pine
General management considerations:
• The main concern in woodland management is plant competition.
Suitable management practices:
• Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
• Low strength is a limitation for local roads and streets.
• Permeability in the lower part of the subsoil is a limitation for septic tank absorption fields.
• Slope is a limitation for dwellings and small commercial buildings.
Suitable management practices:
• Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Increasing the size of the septic tank absorption field and placing field lines on the contour will compensate for restricted permeability.
• Proper design and construction costs are major considerations in excavating or filling sites for dwellings and small commercial buildings.

Be—Beason silt loam, occasionally flooded

Setting

Landscape position: Low stream terraces
Slope range: 0 to 2 percent
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Hay

Typical Profile

Surface layer:
0 to 7 inches, brown silt loam
Subsoil:
7 to 19 inches, brown silty clay loam that has grayish and brownish mottles
19 to 52 inches, mottled yellowish brown, light brownish gray, and strong brown silty clay loam
52 to 60 inches, brown silty clay loam that has grayish and brownish mottles

Inclusions

• Small areas of poorly drained Melvin soils in old stream channels
• Intermingled areas of moderately well drained Wolftever soils on small knolls

Important Soil Properties and Features

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: Occasional, for very brief periods, in winter and spring in most years
High water table: Seasonal, within 1 to 2 feet of the surface, in winter and spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• Seasonal wetness and flooding limit the production and the harvest of some crops.
Suitable management practices:
• Because of wetness and the hazard of flooding early in spring, short-season annuals, such as soybeans or grain sorghum, should be planted.
Capability class: IIw

Pasture and hay

Suitability: Suited
General management considerations:
• Only hay and pasture plants that can tolerate periodic inundation and seasonal wetness should be seeded.
• The high water table limits grazing for several days at a time in winter and early spring.
Suitable management practices:
• Plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• Defer grazing until late spring through early fall.

Woodland

Suitability: Suited
Trees suitable for planting: Yellow-poplar, American sycamore, sweetgum, swamp white oak, green ash, cherrybark oak, and pin oak

General management considerations:
• The main concerns in managing timber are plant competition and the equipment limitation caused by flooding and seasonal wetness.
Suitable management practices:
• Because of a hazard of flooding and the high water table, use of equipment for planting and harvesting is restricted to dry periods from midsummer through early fall.
• Site preparation, such as chopping, burning, applying herbicides, and bedding, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• Residential and commercial uses are poorly suited on this soil because of flooding and seasonal wetness.
Suitable management practices:
• Dwellings, small commercial buildings, and roads and streets should be located in higher areas that are not subject to flooding and excessive wetness.

ByB2—Byler silt loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Stream terraces
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Hay, pasture, and a few small areas of cropland

Typical Profile

Surface layer:
0 to 8 inches, dark yellowish brown silt loam
Subsoil:
8 to 14 inches, yellowish brown silty clay loam
14 to 21 inches, yellowish brown silty clay loam that has brownish mottles
21 to 44 inches, yellowish brown silty clay loam fragipan that has grayish, brownish, and yellowish mottles
44 to 60 inches, yellowish brown gravelly clay that has brownish mottles

Inclusions

• Areas of Lindell soils in slight depressions and in old stream channels
• Areas of well drained Armour soils on slightly higher, convex knolls
• Areas of Tarklin soils on short side slopes adjacent to stream channels

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan; slow in the fragipan
Available water capacity: High or moderate
Soil reaction: Strongly acid or moderately acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, at a depth of 2.0 to 3 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• Most climatically adapted crops grow well if erosion is controlled.
• Seasonal wetness in winter and spring can inhibit rooting depth and plant germination.
Suitable management practices:
• Cover crops, crop rotations, returning crop residue to the soil, and conservation tillage help to control erosion and to increase soil moisture.
• Planting crops later in spring will improve plant germination and early growth.
Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Because of seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched water table limits grazing for several days at a time in winter and early spring.
• Hay yields may be reduced in dry years because of reduced available water capacity.
Suitable management practices:
• Defer grazing until late spring to early fall.
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, white oak, southern red oak, yellow-poplar, eastern white pine, and loblolly pine
General management considerations:
• The main concern in woodland management is plant competition.

Suitable management practices:
• Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• A seasonally perched water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
• Low strength and wetness are limitations for local roads and streets.
• Seasonal wetness is a limitation for dwellings with basements and small commercial buildings.
Suitable Management Practices:
• Subsurface drains, open ditches, or both are needed to lower the water table around areas used as sites for septic tank absorption fields.
• Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Drainage is needed to reduce wetness around dwellings and small commercial buildings.

ByC2—Byler silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Stream terraces
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Hay and pasture

Typical Profile

Surface layer:
0 to 8 inches, dark yellowish brown silt loam
Subsoil:
8 to 14 inches, yellowish brown silty clay loam
14 to 21 inches, yellowish brown silty clay loam that has brownish mottles
21 to 44 inches, yellowish brown silty clay loam fragipan that has grayish, brownish, and yellowish mottles
44 to 60 inches, strong brown gravelly clay that has brownish and reddish mottles

Inclusions

• Areas of well drained Armour soils on slightly higher, convex knolls
• Areas of Tarklin soils on short side slopes adjacent to stream channels

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan; slow in the fragipan
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, at a depth of about 2.0 to 3 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• Accelerated water erosion is a hazard that removes valuable topsoil and that adversely affects rooting depth.
• Seasonal wetness in winter and spring can inhibit plant germination and rooting depth.
Suitable management practices:
• Such practices as no-till and contour stripcropping help to reduce runoff and to control erosion.
• Planting crops later in spring will improve plant germination and early growth.
Capability class: IIIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Because of seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched high water table limits grazing for several days at a time in winter and early spring.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Defer grazing until late spring to early fall.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, white oak, southern red oak, yellow-poplar, eastern white pine, and loblolly pine
General management considerations:
• The main concern in woodland management is plant competition.

Suitable management practices:
• Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• A seasonally perched water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
• Low strength and wetness are limitations for local roads and streets.
• Slope and wetness are limitations for small commercial buildings.
• Dwellings with basements are poorly suited because of wetness.
Suitable management practices:
• Subsurface drains, open ditches, or both are needed to lower the water table around areas used as sites for septic tank absorption fields.
• Designing a drainage system to remove surface water and mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings.
• Providing drainage and diverting surface runoff will reduce wetness around dwellings and small commercial buildings.

DkB—Dickson silt loam, 2 to 5 percent slopes

Setting

Landscape position: Broad, undulating ridgetops
Shape of areas: Irregular
Size of areas: 10 to 50 acres
Major uses: Hay, pasture, and a few small areas of cropland

Typical Profile

Surface layer:
0 to 8 inches, yellowish brown silt loam that has brownish mottles
Subsoil:
8 to 23 inches, yellowish brown silt loam
23 to 36 inches, yellowish brown silty clay loam fragipan that has brownish and grayish mottles
36 to 50 inches, brownish yellow silty clay loam fragipan that has brownish and reddish mottles
50 to 60 inches, yellowish red silty clay that has brownish and grayish mottles

Inclusions

• A few small areas of poorly drained Guthrie soils in depressions
• Areas of well drained Mountview soils on slightly higher, convex knolls

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan; slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, at a depth of 1.5 to 2 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• Most climatically adapted crops grow well if erosion is controlled.
• Seasonal wetness in winter and early spring can inhibit rooting depth and plant germination.
Suitable management practices:
• Cover crops, crop rotations, crop residue returned to the soil, and conservation tillage help to control erosion to acceptable levels and to increase soil moisture.
• Planting crops later in spring will improve plant germination and early growth.
Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Because of seasonal wetness, hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched high water table limits grazing for several days at a time in winter and early spring.
• Hay yields may be reduced in dry years because of the reduced available water capacity.
Suitable management practices:
• Defer grazing until late spring to early fall (fig. 6).
• Maintain the quality and quantity of forage by

Figure 6.—Grazing should be deferred until late spring on Dickson silt loam, 2 to 5 percent slopes, because of seasonal wetness.

rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: White oak, southern red oak, yellow-poplar, eastern white pine, and loblolly pine.
General management considerations:
- The main concern in woodland management is plant competition.

Suitable management practices:
- Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- A seasonally perched water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
- Low strength is a limitation for local roads and streets.
- Dwellings with basements and small commercial buildings are limited because of seasonal wetness.

Suitable management practices:
- Subsurface drains, open ditches, or both will lower the water table around areas to be used as sites for septic tank absorption fields.
- Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
- Providing drainage around dwellings and small commercial buildings will reduce wetness.

Gu—Guthrie silt loam, ponded

Setting

Landscape position: Depressions
Slope range: 0 to 2 percent
Shape of areas: Irregular
Size of areas: 5 to 15 acres
Major use: Woodland

Typical Profile

Surface layer:
0 to 2 inches, brown silt loam that has yellowish mottles
Subsurface layer:
2 to 14 inches, light brownish gray silt loam that has brownish and grayish mottles
Subsoil:
14 to 28 inches, light brownish gray silt loam that has brownish mottles
28 to 46 inches, light brownish gray silt loam fragipan that has brownish and grayish mottles
46 to 60 inches, gray silty clay loam fragipan that has brownish and grayish mottles

Inclusions

- Areas of moderately well drained Dickson soils in slightly higher, convex positions

Important Soil Properties and Features

Drainage class: Poorly drained
Permeability: Slow
Available water capacity: High
Soil reaction: Extremely acid to strongly acid, unless the soil has been limed
Flood hazard: None
High water table: Ponded, 0.5 to 2 feet at the surface, for several weeks in winter and spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Poorly suited
General management considerations:
- Seasonal wetness and ponding limit the production and the harvest of crops.

Suitable management practices:
- If the soil is currently in crop production, planting such short-season annuals as soybeans or grain sorghum later in the growing season is recommended.

Capability class: Vw

Pasture and hay

Suitability: Poorly suited
General management considerations:
- This soil is poorly suited to pasture and hay because of ponding and seasonal wetness.

Suitable management practices:
- In small areas of the unit where ponding is less severe, water-tolerant plants, such as tall fescue and white clover, can be grown for hay.
- Because of excessive wetness, defer grazing until summer and remove livestock in fall.

Woodland

Suitability: Suited to water-tolerant trees
Trees suitable for planting: American sycamore, yellow-poplar, willow oak, swamp white oak, cherrybark oak, and sweetgum
General management considerations:
- The main concerns in woodland management are seedling mortality, the equipment limitation, and plant competition.

Suitable management practices:
- Planting water-tolerant species and bedding the rows help to increase seedling survival.
- Logging during dry periods in summer and early fall and using low-pressure ground equipment will lessen soil damage and help to maintain productivity.

Residential and commercial uses

Suitability: Unsuited
General management considerations:
- This soil is unsuited to residential and commercial uses because of ponding and excessive seasonal wetness.

HaD—Hawthorne gravelly silt loam, 12 to 20 percent slopes

Setting

Landscape position: Hillsides and rolling ridgetops
Shape of areas: Long and irregular
Size of areas: 5 to 25 acres
Major use: Woodland

Typical Profile

Surface layer:
0 to 2 inches, yellowish brown gravelly silt loam
Subsurface layer:
2 to 14 inches, light yellowish brown gravelly silt loam that has brownish mottles
Subsoil:
14 to 26 inches, strong brown very channery silt loam that has brownish and yellowish mottles
Substratum:
26 to 60 inches, alternating strata of highly fractured siltstone and silty clay loam

Inclusions

- Areas of Sulphura soils on shoulder slopes
- Small, intermingled areas of Minvale soils on narrow footslopes

Important Soil Properties and Features

Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Strongly acid to extremely acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Soft bedrock is at variable depths

between 20 and 40 inches; hard bedrock is at a depth of more than 5 feet

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
• This soil is unsuited to row crops because of slope, low available water capacity, depth to rock, and numerous fragments in the surface layer and the subsoil.
Capability class: VIs

Pasture and hay

Suitability: Poorly suited
General management considerations:
• Low available water capacity causes poor or sparse pasture stands.
• Slope increases the hazard of erosion if plants are overgrazed.
Suitable management practices:
• Drought-tolerant forage plants should be seeded.
• Pasture renovation of drought-tolerant grasses and legumes is needed when the better forage plants have decreased to levels less than those needed for optimum production.
• Adjusting stocking rates prevents overgrazing, especially on steeper slopes.

Woodland

Suitability: Suited to drought-resistant species
Trees suitable for planting: Eastern redcedar, white oak, mockernut hickory, chestnut oak, and Virginia pine
General management considerations:
• The main concerns in woodland management are seedling mortality, the equipment limitation, and plant competition.
Suitable management practices:
• Selecting drought-resistance species and planting on north- and east-facing slopes will lessen seedling mortality.
• Because of slope, fragments in the surface layer and the subsoil, and depth to rock, careful planning is needed in laying out skid trails and access roads during harvesting and planting operations.
• Controlled burning, applying herbicides, and girdling or cutting unwanted trees will reduce competing vegetation.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• Residential and commercial uses are poorly suited because of slope and depth to rock.

HgC—Hawthorne-Sugargrove complex, 5 to 12 percent slopes

Setting

Landscape position: Rolling ridgetops
Shape of areas: Long and narrow
Size of areas: 5 to 100 acres
Composition of the unit: 50 percent Hawthorne soil, 30 percent Sugargrove soil, and 20 percent included soils
Major use: Woodland

Typical Profile

Hawthorne

Surface layer:
0 to 2 inches, yellowish brown gravelly silt loam
Subsurface layer:
2 to 14 inches, light yellowish brown gravelly silt loam that has brownish mottles
Subsoil:
14 to 26 inches, strong brown very channery silt loam that has brownish and yellowish mottles
Substratum:
26 to 60 inches, alternating strata of highly fractured siltstone and silty clay loam

Sugargrove

Surface layer:
0 to 4 inches, brown gravelly silt loam
Subsurface layer:
4 to 15 inches, light yellowish brown gravelly silt loam
Subsoil:
15 to 29 inches, strong brown gravelly silty clay loam
29 to 45 inches, strong brown channery silty clay loam that has brownish and reddish mottles
Substratum:
45 to 60 inches, alternating strata of highly fractured siltstone and silty clay loam

Inclusions

• A few small areas of Mountview soils on slightly higher, convex ridgetops
• Areas of well drained soils that have a clayey subsoil on small, dome-shaped knolls

Important Soil Properties and Features

Drainage class: Hawthorne—somewhat excessively drained; Sugargrove—well drained

Permeability: Sugargrove—moderate; Hawthorne—moderately rapid
Available water capacity: Hawthorne—low; Sugargrove—moderate
Soil reaction: Hawthorne—extremely acid to strongly acid; Sugargrove—strongly acid or very strongly acid
Flood hazard: None
High water table: None
Depth to rock: Hawthorne—between 20 and 40 inches; Sugargrove—between 40 and 60 inches

Use and Management

Cropland

Suitability: Poorly suited
General management considerations:
• The size and shape of the unit, the hazard of erosion, slope, low available water capacity, and depth to rock are major limitations for crop production.
Suitable management practices:
• Other areas that are more desirable for crops should be used.
Capability class: Hawthorne and Sugargrove—IVs

Pasture and hay

Suitability: Suited
General management considerations:
• Pasture renovation is needed when the better forage plants have decreased to levels less than those needed for optimum production.
• Slope increases the hazard of erosion if plant stands are overgrazed or poor.
• In most years low available water capacity reduces yields.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Drought-tolerant forage plants should be seeded.
• Reduce the risk of erosion by avoiding overgrazing, especially on the steeper slopes.

Woodland

Suitability: Suited
Trees suitable for planting: Eastern redcedar, white oak, mockernut hickory, chestnut oak, and Virginia pine
General management considerations:
• The main concerns in woodland management are seedling mortality and plant competition.
Suitable management practices:
• Selecting drought-resistant species and planting on north-facing slopes will lessen seedling mortality.
• Controlled burning, applying herbicides, and girdling or cutting unwanted trees will reduce competing vegetation.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• Depth to rock is a limitation for septic tank absorption fields.
• Untreated effluent can move along the surface of this restrictive layer, seep in downslope areas, and cause a health hazard.
• Slopes cut for dwellings, small commercial buildings, and roadbeds generally are stable, but slumping and slippage can occur because the bedrock is highly fractured and rock layers are parallel to the slope.
Suitable management practices:
• Onsite investigation is needed to determine if sites for septic tank absorption fields are underlain by unsuitable material.
• Because the soil is subject to slumping, especially in the steeper areas, locating structures and roads in the more gently sloping areas and designing a drainage system minimize the hazard of slumping.

HsF—Hawthorne-Sulphura association, steep

Setting

Slope range: 20 to 60 percent
Landscape position: Steep hillsides
Shape of areas: Irregular
Size of areas: 25 to 500 acres
Composition of the unit: 55 percent Hawthorne soils, 35 percent Sulphura soils, and 10 percent included soils
Major use: Woodland

Typical Profile

Hawthorne

Surface layer:
0 to 2 inches, yellowish brown gravelly silt loam
Subsurface layer:
2 to 14 inches, light yellowish brown gravelly silt loam that has brownish mottles
Subsoil:
14 to 26 inches, strong brown very channery silt loam that has brownish and yellowish mottles
Substratum:
26 to 60 inches, alternating strata of highly fractured siltstone and silty clay loam

Sulphura

Surface layer:
0 to 6 inches, dark brown gravelly silt loam
Subsurface layer:
6 to 12 inches, brown channery silt loam that has brownish mottles
Subsoil:
12 to 22 inches, yellowish brown very channery silt loam
22 inches, hard gray bedrock

Inclusions

- Small areas of similar soils that are shallower than 20 inches to hard bedrock
- Intermingled areas of well drained Sengtown soils on the upper shoulders of side slopes and well drained Minvale soils on footslopes
- Areas of very deep, very gravelly soils at the base of steep side slopes that formed in colluvium and soil creep

Important Soil Properties and Features

Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Available water capacity: Low or very low
Soil reaction: Hawthorne—strongly acid to extremely acid; Sulphura—strongly acid or moderately acid
Flood hazard: None
High water table: None
Depth to rock: Between 20 and 40 inches

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
- This unit is unsuited to crops because of very low or low available water capacity, depth to rock, slope, and numerous fragments in the surface layer and in the subsoil.

Capability class: Hawthorne and Sulphura—VIIs

Pasture and hay

Suitability: Poorly suited
General management considerations:
- Slope, very low or low available water capacity, coarse fragments in the surface layer and in the subsoil, and depth to rock are major limitations.

Suitable management practices:
- Forage plants that can tolerate droughty conditions should be seeded.
- Drought-tolerant grasses and legumes will require pasture renovation when the better forage plants have decreased to levels less than needed for optimum production.
- Adjusting stocking rates will be required to prevent overgrazing.

Woodland

Suitability: Suited to drought-resistant species
Trees suitable for planting: Eastern redcedar, white oak, mockernut hickory, chestnut oak, and Virginia pine
General management considerations:
- The main concerns in woodland management are seedling mortality, the equipment limitation, and plant competition.

Suitable management practices:
- Selecting drought-resistance species and planting on north- or east-facing slopes will lessen seedling mortality.
- Conventional wheeled and tracked equipment can be used in moderately steep areas, but more specialized harvesting methods may be needed in the steeper areas.
- Careful planning is needed when laying out skid trails and access roads for harvesting and planting operations because of steep slope, fragments in the surface layer and in the subsoil, and depth to rock.
- Competing vegetation can be reduced by controlled burning, applying herbicides, and girdling or cutting unwanted trees.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- This unit is poorly suited to most uses because of slope, depth to rock, and a hazard of seepage and slumping.

HuA—Humphreys gravelly silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landscape position: Low stream terraces
Shape of areas: Long and narrow
Size of areas: 5 to 50 acres
Major uses: Hay and pasture

Typical Profile

Surface layer:
0 to 5 inches, dark brown gravelly silt loam
Subsurface layer:
5 to 13 inches, dark yellowish brown gravelly silt loam
Subsoil:
13 to 40 inches, strong brown gravelly silty clay loam
40 to 46 inches, strong brown gravelly silt loam

Substratum:
46 to 60 inches, strong brown very gravelly silt loam

Inclusions

- Intermingled areas of Armour soils
- Small, narrow strips of Sullivan soils adjacent to stream channels
- Small, narrow strips of moderately well drained Lindell soils below rock bluffs and steep side slopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, unless the soil has been limed
Flood hazard: Occasional, for very brief periods, in winter and early spring
High water table: Seasonal, at a depth of 5.0 to 6.0 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
- Most climatically adapted crops can be grown and good yields can be attained.
- Small grain produces good yields, but can be damaged by occasional flooding.

Suitable management practices:
- Occasional flooding occurs in winter, and does not limit management.

Capability class: IIw

Pasture and hay

Suitability: Well suited
General management considerations:
- Because of flooding, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.

Suitable management practices:
- Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, white oak, white ash, hickory, sweetgum, and loblolly pine
General management considerations:
- The main limitation in woodland management is plant competition.

Suitable management practices:
- Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- This soil is poorly suited to all residential and commercial uses because of the hazard of flooding.

Suitable management practices:
- Locating dwellings, commercial structures, and roads and streets above expected flood levels will reduce the hazard of flooding.

HuB—Humphreys gravelly silt loam, 2 to 5 percent slopes

Setting

Landscape position: Footslopes and stream terraces
Shape of areas: Long and irregular
Size of areas: 5 to 25 acres
Major uses: Hay, pasture, and woodland

Typical Profile

Surface layer:
0 to 5 inches, dark brown gravelly silt loam
Subsurface layer:
5 to 13 inches, dark yellowish brown gravelly silt loam
Subsoil:
13 to 40 inches, strong brown gravelly silty clay loam
40 to 46 inches, strong brown gravelly silt loam
Substratum:
46 to 60 inches, strong brown very gravelly silt loam

Inclusions

- Small, narrow strips of moderately well drained Tarklin soils on short side slopes
- Areas of Minvale soils in slightly higher positions on footslopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, unless the soil has been limed
Flood hazard: None
High water table: Seasonal, in seep areas, at a depth of 5.0 to 6.0 feet, in winter and early spring
Depth to rock: More than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• A suitable conservation tillage system is needed to help to control erosion.
• Grasses and legumes grow well if fertility levels and lime content are adequate.
• Coarse fragments on or near the surface of the soil can hinder tillage and the amount of moisture available to plants in dry years.
Suitable management practices:
• Conservation practices including no-till, contour cultivation, stripcropping, and cover crops help to increase soil moisture and to control erosion.
• A cropping system including grasses, legumes, or grass-legume mixtures; rotating crops; and returning crop residue to the soil will maintain or improve tilth.
Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• In dry years low available water capacity can reduce hay yields on moisture-sensitive crops, such as alfalfa.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields when moisture is adequate and other management needs such as liming and fertilization are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, white oak, white ash, hickory, sweetgum, and loblolly pine
General management considerations:
• The main limitation for managing timber is plant competition.
Suitable management practices:
• Site preparation, such as chopping and burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Well suited
General management considerations:
• On footslopes seasonal wetness caused by seepage from higher areas is a hazard for dwellings and small commercial buildings.
Suitable management practices:
• Installing subsurface tile drainage diverts seepage around areas used as sites for septic tank absorption fields and structures.

HuC—Humphreys gravelly silt loam, 5 to 12 percent slopes

Setting

Landscape position: Footslopes and stream terraces
Shape of areas: Long and irregular
Size of areas: 5 to 25 acres
Major uses: Woodland, hay, and pasture

Typical Profile

Surface layer:
0 to 5 inches, dark brown gravelly silt loam
Subsurface layer:
5 to 13 inches, dark yellowish brown gravelly silt loam
Subsoil:
13 to 40 inches, strong brown gravelly silty clay loam
40 to 46 inches, strong brown gravelly silt loam
Substratum:
46 to 60 inches, strong brown very gravelly silt loam

Inclusions

• Small, narrow strips of moderately well drained Tarklin soils on short, steep side slopes
• Areas of Minvale soils in slightly higher positions on footslopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, unless the soil has been limed
Flood hazard: None
High water table: Seasonal, in seep areas, at a depth of 5.0 to 6.0 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• The hazard of accelerated erosion by water removes valuable topsoil and adversely affects rooting depth.
• Coarse fragments on or near the surface of the soil can hinder tillage and the amount of moisture available to plants in dry years.
Suitable management practices:
• Conservation practices including no-till, contour

cultivation, stripcropping, and cover crops will increase soil moisture and help to control erosion.
• A cropping system that includes grasses, legumes, or grass-legume mixtures; rotating crops; and returning crop residue to the soil will maintain or improve tilth.
Capability class: IIIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Slope can increase the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
• In dry years, low available water capacity can reduce hay yields on moisture-sensitive crops, such as alfalfa.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields when moisture is adequate and other management needs, such as liming and fertilization, are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, white oak, white ash, hickory, sweetgum, and loblolly pine
General management considerations:
• The main limitation for managing timber is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
• Slope is a limitation for small commercial buildings.
• Septic tank absorption fields, dwellings, and commercial buildings on footslopes are limited by slope and by seasonal wetness caused by seepage from higher areas.
• Slope is a concern for local roads and streets.
Suitable management practices:
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.
• Installing subsurface tile drainage diverts seepage around areas used as sites for septic tank absorption fields and structures.
• Placing roads and streets in less sloping areas will reduce cutting and filling.

LaB—Lax silt loam, 2 to 5 percent slopes

Setting

Landscape position: Undulating ridgetops
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Hay, pasture, and woodland

Typical Profile

Surface layer:
0 to 10 inches, dark yellowish brown silt loam
Subsoil:
10 to 20 inches, yellowish brown silty clay loam
20 to 24 inches, yellowish brown silty clay loam that has brownish mottles
24 to 36 inches, brownish yellow extremely gravelly silty clay loam fragipan that has brownish and grayish mottles
36 to 60 inches, yellowish red very gravelly silty clay that has brownish mottles

Inclusions

• Small areas of Dickson soils in saddles

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan; slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, above the fragipan at a depth of 1.5 to 2.5 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• Accelerated water erosion is a hazard that can remove valuable topsoil and that adversely affects rooting depth.
• Plants may experience moisture stress in dry summers because of limited available water capacity.
• Seasonal wetness in winter and spring can inhibit rooting depth and plant germination.
Suitable management practices:
• Cover crops, crop rotations, returning crop residue to the soil, and conservation tillage help to control erosion and to increase soil moisture.
• Planting crops later in the season will increase plant germination and early growth.

Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Because of seasonal wetness, plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched water table limits grazing for several days at a time in winter and early spring.
• Hay yields may be moderate or low in dry years because of reduced available water capacity.
Suitable management practices:
• Defer grazing until late spring through early fall.
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: White oak, southern red oak, chestnut oak, hickory, eastern redcedar, and Virginia pine
General management considerations:
• The main limitations for woodland management is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• A perched water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
• Seasonal wetness and seepage are limitations for dwellings with basements.
• Low strength is a limitation for local roads and streets.
• Seasonal wetness is a limitation for small commercial buildings and dwellings without basements.
Suitable management practices:
• Installing subsurface drains or open ditches lowers the water table around areas used as sites for septic tank absorption fields and dwellings with basements.
• Increasing the size of absorption fields or adding suitable fill material on the surface helps to overcome restricted permeability.
• Mixing the upper part of the soil with coarser textured material increases the strength and stability of the base for local roads and streets.
• Providing drainage and diverting runoff away from foundations will reduce wetness around small commercial buildings and dwellings.

LaC—Lax silt loam, 5 to 12 percent slopes

Setting

Landscape position: Rolling ridgetops and side slopes
Shape of areas: Irregular
Size of areas: 25 to 200 acres
Major uses: Hay, pasture, and woodland

Typical Profile

Surface layer:
0 to 10 inches, dark yellowish brown silt loam
Subsoil:
10 to 20 inches, yellowish brown silty clay loam
20 to 24 inches, yellowish brown silty clay loam that has brownish mottles
24 to 36 inches, brownish yellow extremely gravelly silty clay loam fragipan that has brownish and grayish mottles
36 to 60 inches, yellowish red very gravelly silty clay that has brownish mottles

Inclusions

• Areas of well drained Saffell soils on shoulder slopes
• Small areas of Dickson soils in saddles

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above, slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, above the fragipan at a depth of 1.5 to 2.5 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• Accelerated water erosion is a hazard that removes valuable topsoil and that adversely affects rooting depth.
• Plants may experience moisture stress in dry summers because of moderate available water capacity.
• Seasonal wetness in winter and spring can inhibit rooting depth and plant germination.

Suitable management practices:
• Such practices as no-till and contour stripcropping help to reduce runoff and to control erosion.
• Cover crops, crop rotations, returning crop residue to the soil, and conservation tillage help to increase soil moisture.
• Planting crops later in the season will increase plant germination and early growth.
Capability class: IIIe

Pasture and hay

Suitability: Well suited (fig. 7)
General management considerations:
• Because of seasonal wetness, plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched water table limits grazing for several days at a time in winter and early spring.
• Hay yields may be moderate or low in dry years because of reduced available water capacity.
Suitable management practices:
• Defer grazing until late spring through early fall.
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: White oak, southern red oak, chestnut oak, hickory, eastern redcedar, and Virginia pine
General management considerations:
• The main limitations for woodland management are the erosion hazard and plant competition.
Suitable management practices:
• Seeding logging roads and skid trails to permanent plant cover helps to control erosion.
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• A perched water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
• Seasonal wetness and seepage are limitations for dwellings with basements.
• Low strength is a limitation for local roads and streets.
• Slope and seasonal wetness are limitations for small commercial buildings.
• Seasonal wetness and slope are limitations for dwellings without basements.
Suitable management practices:

Figure 7.—Lax silt loam, 5 to 12 percent slopes, on rolling ridgetops is well suited to hay and pasture.

• Installing subsurface drains or open ditches will lower the water table around areas used as sites for septic tank absorption fields and dwellings with basements.
• Increasing the size of the absorption field or adding suitable fill material on the surface helps to overcome the restricted permeability.
• Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.

Ld—Lindell silt loam, occasionally flooded

Setting

Landscape position: Flood plains
Slope range: 0 to 3 percent
Shape of areas: Long and narrow
Size of areas: 5 to 25 acres
Major uses: Hay and woodland

Typical Profile

Surface layer:
0 to 6 inches, brown silt loam
Subsoil:
6 to 22 inches, brown silt loam that has brownish mottles
22 to 32 inches, dark grayish brown silty clay loam that has brownish mottles
32 to 48 inches, dark grayish brown clay loam
Substratum:
48 to 60 inches, dark grayish brown gravelly loam

Inclusions

• Areas of well drained Sullivan and Nolin soils near stream channels
• Areas of well drained Armour and moderately well drained Byler soils in slightly higher positions

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid to neutral
Flood hazard: Occasional, for very brief periods, in winter and early spring in most years
High water table: Seasonal, within 2.0 to 3.0 feet of the surface, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• Most climatically adapted crops can be grown and good yields can be attained.
• Occasional flooding can damage small grain.
Suitable management practices:
• Planting crops later in the season lessens the hazard of flood damage.
• Small grain should be planted in higher areas not subject to flooding.
Capability class: IIw

Pasture and hay

Suitability: Well suited
General management considerations:
• Because of seasonal wetness and flooding, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• Seasonal wetness limits grazing for several days at a time in winter and early spring.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Defer grazing until late spring through early fall.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, yellow-poplar, American sycamore, sweetgum, and cherrybark oak
General management considerations:
• The main limitation for managing timber is plant competition.
• Seedling mortality is also a concern in planting.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.
• Planting larger seedlings, bedding rows, and providing surface drainage will increase seedling survival.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• Flooding and seasonal wetness are limitations for all residential and commercial uses.
Suitable management practices:

• Locating dwellings, commercial structures, and roads and streets in areas above expected flood levels will reduce the hazard of flooding.

Me—Melvin silt loam, frequently flooded

Setting

Landscape position: Flood plains
Slope range: 0 to 2 percent
Shape of areas: Irregular and narrow
Size of areas: 5 to 50 acres
Major uses: Habitat for both woodland and wetland wildlife

Typical Profile

Surface layer:
0 to 10 inches, light olive brown silt loam that has brownish mottles
Subsoil:
10 to 39 inches, grayish brown silt loam that has grayish, brownish, and reddish mottles
Substratum:
39 to 50 inches, light brownish gray silt loam that has brownish, yellowish, and grayish mottles
50 to 60 inches, grayish brown gravelly silty clay loam that has brownish mottles

Inclusions

• Small areas of moderately well drained Byler soils and somewhat poorly drained Beason soils in slightly higher positions
• Areas of poorly drained soils that have a clayey subsoil in slight depressions

Important Soil Properties and Features

Drainage class: Poorly drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Slightly acid or neutral
Flood hazard: Frequent, for long durations, in late winter and early spring
High water table: Seasonal, within 1 foot of the surface, in winter and spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
• Seasonal wetness and frequent flooding limit producing and harvesting crops.

Capability class: IVw

Pasture and hay

Suitability: Poorly suited
General management considerations:
• This soil is poorly suited to pasture and hay because of frequent flooding and seasonal wetness.
Suitable management practices:
• In some fringe areas of the unit where flooding is less severe, such water-tolerant plants as tall fescue and white clover may be grown for pasture.

Woodland

Suitability: Suited to water-tolerant trees; the unit provides excellent habitat for wetland wildlife.
Trees suitable for planting: In areas where flooding is shorter in duration: American sycamore, sweetgum, willow oak, cherrybark oak, swamp white oak, green ash, shagbark hickory, and pin oak; in areas where flooding lasts for several months: baldcypress, sweetgum, green ash, swamp tupelo, and black willow
General management considerations:
• The main limitations for woodland management are seedling mortality and plant competition.
• Equipment limitations caused by flooding and seasonal wetness are also management concerns.
Suitable management practices:
• Planting water-tolerant species and bedding rows will increase seedling survival.
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.
• Harvesting and planting operations should be limited to late summer and early fall when seasonal wetness and the hazard of flooding are reduced.

Residential and commercial uses

Suitability: Unsuited
General management considerations:
• All residential and commercial uses are unsuited on this soil because of frequent flooding and seasonal wetness.

MnC—Minvale gravelly silt loam, 5 to 12 percent slopes

Setting

Landscape position: Footslopes
Shape of areas: Irregular
Size of areas: 5 to 25 acres
Major uses: Pasture, hay, and woodland

Typical Profile

Surface layer:
0 to 6 inches, dark yellowish brown gravelly silt loam
Subsoil:
6 to 15 inches, strong brown gravelly silty clay loam
15 to 30 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
30 to 60 inches, yellowish red gravelly silty clay loam that has brownish mottles

Inclusions

- Small areas of Armour soils in slightly lower positions than those of the Minvale soil
- Areas of moderately well drained Tarklin soils on short, steep side slopes adjacent to flood plains

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
- Accelerated water erosion is a hazard that removes valuable topsoil and that adversely affects rooting depth.

Suitable management practices:
- Conservation practices, such as no-till and contour stripcropping, help to reduce runoff and to control erosion.
- Using a cropping system that includes grasses, legumes, or grass-legume mixtures; rotating crops; using minimum tillage; and growing cover crops will maintain or improve tilth.

Capability class: IIIe

Pasture and hay

Suitability of unit: Well suited
General management considerations:
- Slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.

Suitable management practices:
- Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
- Alfalfa grows well and produces good yields where adequate liming, fertilization, and other management needs are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, white oak, southern red oak, hickory, eastern redcedar, and loblolly pine
General management considerations:
- The main limitation for managing timber is plant competition.

Suitable management practices:
- Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
- Slope is a limitation for small commercial buildings and dwellings.
- Slope and permeability of the subsoil are limitations for septic tank absorption fields.
- Slope and low strength are limitations for local roads and streets.

Suitable management practices:
- Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.
- Increasing the size of the septic tank absorption area and installing field lines on the contour will compensate for permeability and slope.
- Placing roads and streets in less sloping areas of the unit will reduce cutting and filling; and, mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base.

MnD—Minvale gravelly silt loam, 12 to 20 percent slopes

Setting

Landscape position: Footslopes
Shape of areas: Long and narrow
Size of areas: 5 to 25 acres
Major use: Woodland

Typical Profile

Surface layer:
0 to 6 inches, dark yellowish brown gravelly silt loam
Subsoil:
6 to 15 inches, strong brown gravelly silty clay loam
15 to 30 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles

30 to 60 inches, yellowish red gravelly silty clay loam that has brownish mottles

Inclusions

- Small areas of Armour and Humphreys soils in less sloping areas at the base of footslopes
- Areas of moderately well drained Tarklin soils on short, steep side slopes adjacent to flood plains

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Poorly suited
General management considerations:
- This soil should not be used continuously as cropland because of slope and the hazard of erosion.

Suitable management practices:
- Areas used as cropland should be cultivated across the slope and using a rotation in which the land remains in sod for several seasons following cultivation.
- Conservation practices, such as no-till and contour stripcropping, help to reduce runoff and to control erosion.

Capability class: IVe

Pasture and hay

Suitability: Suited
General management considerations:
- Slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
- Pasture renovation will be needed when the better forage plants have decreased to levels less than those needed for optimum production.

Suitable management practices:
- Adjusting stocking, especially on the steeper slopes, will prevent overgrazing and help to reduce the hazard of erosion.
- Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, white oak, southern red oak, hickory, eastern redcedar, and loblolly pine
General management considerations:
- The main limitations for woodland management are the hazard of erosion, restrictions for equipment, and plant competition.

Suitable management practices:
- Seeding logging roads and skid trails to permanent plant cover helps to reduce the hazard of erosion.
- Conventional wheeled and tracked vehicles can be used in harvesting operations, but their use may be limited during rainy periods in winter to late spring.
- Site preparation, such as burning, herbicide application, and girdling or cutting unwanted trees, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- Slope is a limitation for dwellings and small commercial buildings.
- Slope and permeability in the subsoil are limitations for septic tank absorption fields.
- Slope and low strength are major limitations for local roads and streets.

Suitable management practices:
- Increasing the size of the septic tank absorption field and placing filter lines on the contour help to overcome slope and permeability.
- Proper design and construction costs are major considerations in excavating or filling sites for dwellings and small commercial buildings.
- Laying out roads and streets in less sloping areas will reduce cutting and filling; mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.

MtB—Mountview silt loam, 2 to 5 percent slopes

Setting

Landscape position: Undulating ridgetops
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Hay and pasture

Typical Profile

Surface layer:
0 to 9 inches, yellowish brown silt loam
Subsoil:
9 to 22 inches, yellowish brown silty clay loam

22 to 34 inches, strong brown silty clay loam that has brownish mottles
34 to 60 inches, red clay that has yellowish and brownish mottles

Inclusions

• Small areas of moderately well drained Dickson soils in saddles and in slight depressions
• Areas of Sengtown soils in sloping areas adjacent to steeper side slopes
• In the southeastern part of the county, small areas of Hawthorne soils on shoulder slopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• Most locally adapted crops can be grown and good yields can be attained.
• A suitable conservation tillage system is needed to control erosion.
Suitable management practices:
• No-till, contour cultivation, and stripcropping help to reduce erosion and to maintain productivity.
Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• This soil has no significant limitations for forage production if erosion is controlled.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields where adequate liming, fertilization, and other management needs are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, white oak, southern red oak, hickory, and eastern white pine
General management considerations:
• The main limitation for woodland management is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
• Low strength is a limitation for local roads and streets.
• Permeability in the lower part of the subsoil is a limitation for septic tank absorption fields.
• Shrink-swell potential in the lower part of the subsoil is a limitation for dwellings with basements.
Suitable management practices:
• Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Increasing the size of the septic tank absorption field compensates for restricted permeability.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff from buildings will prevent possible structural damage to dwellings.

MtC2—Mountview silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling ridgetops and side slopes
Shape of areas: Irregular
Size of areas: 5 to 150 acres
Major uses: Hay and pasture

Typical Profile

Surface layer:
0 to 6 inches, yellowish brown silt loam
Subsoil:
6 to 22 inches, yellowish brown silty clay loam
22 to 34 inches, strong brown silty clay loam that has brownish mottles
34 to 60 inches, red clay that has yellowish and brownish mottles

Inclusions

• Small areas of moderately well drained Dickson soils in saddles and slight depressions
• Areas of Sengtown soils in sloping areas adjacent to steeper side slopes

• In the southeastern section of the county, small areas of Hawthorne soils on shoulder slopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• Accelerated water erosion is a hazard that removes valuable topsoil and that adversely affects rooting depth.
Suitable management practices:
• Conservation practices, such as no-till and contour stripcropping, help to reduce runoff and to control erosion.
• Using a cropping system that includes grasses, legumes, or grass-legume mixtures; rotating crops; using minimum tillage; and growing cover crops will maintain or improve tilth.
Capability class: IIIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields where adequate liming, fertilization, and other management needs are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, white oak, southern red oak, hickory, and eastern white pine
General management considerations:
• The main limitations for management of timber are the hazard of erosion and plant competition.
Suitable management practices:
• Limiting the use of equipment in harvesting and planting operations when the soil is wet and carefully designing access roads and skid trails help to control erosion.
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
• Slope is a limitation for small commercial buildings.
• Low strength is a limitation for local roads and streets.
• Slope and permeability in the lower part of the subsoil are limitations for septic tank absorption fields.
• Slope and shrink-swell potential in the lower part of the subsoil are limitations for dwellings.
Suitable management practices:
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.
• Laying out roads and streets in less sloping areas of the unit will reduce cutting and filling; mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Increasing the size of the septic tank absorption area and placing field lines on the contour help to compensate for slope and the restricted permeability.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings will prevent possible structural damage to dwellings.

No—Nolin silt loam, occasionally flooded

Setting

Landscape position: Flood plains
Slope range: 0 to 2 percent
Shape of areas: Long and narrow
Size of areas: 5 to 50 acres
Major uses: Cropland or hay

Typical Profile

Surface layer:
0 to 5 inches, brown silt loam that has brownish mottles
Subsoil:
5 to 60 inches, dark yellowish brown silt loam that has brownish mottles

Inclusions

• Small areas of moderately well drained Lindell soils

in slight depressions and in narrow strips below steep upland hillsides
- Narrow strips of Sullivan soils along stream levees

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid to neutral
Flood hazard: Occasional, for brief periods, in winter and early spring in most years
High water table: Seasonal, at a depth of 6 feet or more, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
- Most locally adapted crops can be grown and good yields can be attained.
- Occasional flooding can damage small grain.

Suitable management practices:
- Planting crops later in spring will lessen the hazard of flood damage.
- Small grain should be planted in higher areas not subject to flooding.

Capability class: IIw

Pasture and hay

Suitability: Well suited
General management considerations:
- Because of flooding, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.

Suitable management practices:
- Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, white ash, yellow-poplar, American sycamore, sweetgum, and cherrybark oak
General management considerations:
- The main limitation for timber management is plant competition.

Suitable management practices:
- Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- All residential and commercial uses are poorly suited on this soil because of the hazard of flooding.

Suitable management practices:
- Locating dwellings, commercial structures, and roads and streets above expected flood level will reduce the hazard of flooding.

Pq—Pits, quarry

This unit consists of areas that are active stone quarries. The soil material has been removed down to hard bedrock, which is being drilled and blasted for various local uses. The major use is for gravel in the transportation and construction industries. Vertical sidewalls consist of hard limestone bedrock. Generally, an area adjacent to the site is used to deposit the soil overburden and undesirable rock material. These spoil areas will be used in reclaiming the area to vegetation. Several areas adjacent to active quarries have been planted to trees and permanent grasses.

This unit has not been assigned a capability class.

Rc—Rock outcrop, very steep

This unit consists of vertical rock bluffs along the Harpeth River and many major streams in the county (fig. 8). Slopes range from 60 to more than 100 percent. Most of the unit consists of siltstone and limestone bedrock and a few areas of talus on rock benches. In a few areas thin layers of loamy soil material less than 12 inches deep overlie hard bedrock. In most of these areas sparse vegetation grows in rock seams and along ledges where talus material has accumulated. It consists of eastern redcedar and shrubs.

This unit has not been assigned a capability class.

SaD—Saffell gravelly fine sandy loam, 12 to 20 percent slopes

Setting

Landscape position: Hillsides
Shape of areas: Irregular
Size of areas: 5 to 25 acres
Major use: Woodland

Typical Profile

Surface layer:
0 to 3 inches, dark yellowish brown gravelly fine sandy loam
Subsurface layer:
3 to 10 inches, brown gravelly fine sandy loam
Subsoil:
10 to 30 inches, strong brown very gravelly sandy clay loam
30 to 36 inches, strong brown very gravelly sandy clay loam that has reddish and yellowish mottles
Substratum:
36 to 60 inches, variegated strong brown, brownish yellow, red, and yellow gravelly sandy loam that has strata of sandy clay loam and loamy sand

Inclusions

- Areas of moderately well drained Lax soils on upper shoulder slopes
- Areas of Sengtown soils on hillsides adjacent to major streams, in lower positions than those of the Saffell soil
- Areas of Humphreys and Minvale soils on narrow footslopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
- This soil is unsuited to row crops because of slope,

Figure 8.—Rock outcrop, very steep, provides scenic beauty for recreation uses. The unit, however, has major limitations for residential and commercial development.

low available water capacity, and numerous fragments in the surface layer and the subsoil.
Capability class: VIs

Pasture and hay

Suitability: Poorly suited
General management considerations:
• Low available water capacity causes droughtiness and reduced yields.
• Slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
Suitable management practices:
• Forage plants that can tolerate droughty conditions should be seeded.
• Adjusting stocking rates prevents overgrazing and helps to control erosion.

Woodland

Suitability: Suited to drought-tolerant species
Trees suitable for planting: White oak, chestnut oak, Virginia pine, mockernut hickory, and eastern redcedar
General management considerations:
• The main limitations for woodland management are the erosion hazard, restrictions to equipment use, and plant competition.
Suitable management practices:
• Seeding logging roads and skid trails to permanent plant cover helps to control erosion.
• Coarse fragments in the surface layer and in the subsoil may require special planning, special equipment, or both in harvesting and planting operations.
• Site preparation, such as burning, herbicide, application, and girdling or cutting unwanted trees, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• Slope is a limitation for dwellings, small commercial buildings, and local roads and streets.
• Slope and permeability in the subsoil are limitations for septic tank absorption fields.
Suitable management practices:
• Proper design and construction costs are major considerations in excavating or filling sites for dwellings and small commercial buildings.
• Placing roads and streets in less sloping areas of the unit will reduce cutting and filling.
• Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome permeability and slope.

SaF—Saffell gravelly fine sandy loam, 20 to 60 percent slopes

Setting

Landscape position: Steep hillsides
Shape of areas: Irregular
Size of areas: 10 to 300 acres
Major use: Woodland

Typical Profile

Surface layer:
0 to 3 inches, dark yellowish brown gravelly fine sandy loam
Subsurface layer:
3 to 10 inches, brown gravelly fine sandy loam
Subsoil:
10 to 30 inches, strong brown very gravelly sandy clay loam
30 to 36 inches, strong brown very gravelly sandy clay loam that has reddish and yellowish mottles
Substratum:
36 to 60 inches, variegated strong brown, brownish yellow, red, and yellow gravelly sandy loam that has strata of sandy clay loam and loamy sand

Inclusions

• Areas of moderately well drained Lax soils on the upper part of shoulder slopes
• Areas of Sengtown soils in lower positions on hillsides, adjacent to major streams.
• Areas of Humphreys and Minvale soils on narrow footslopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Low
Soil reaction: Very strongly acid or strongly acid
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
• This soil is unsuited to row crops because of slope, low available water capacity, and numerous fragments in the surface layer and the subsoil.
Capability class: VIIs

Pasture and hay

Suitability: Poorly suited
General management considerations:
• Low available water capacity causes droughtiness and reduced yields.
• Steep slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
Suitable management practices:
• Forage plants that can tolerate droughty conditions should be seeded.
• Adjusting stocking rates prevents overgrazing on the steeper slopes and helps to control erosion.
• Pasture in areas where slope is more than 30 percent may be too steep for safe operation of farm equipment unless access roads are built on the contour for broadcasting seed, fertilizer, lime, and herbicides.

Woodland

Suitability: Suited to drought-tolerant species
Trees suitable for planting: White oak, chestnut oak, Virginia pine, mockernut hickory, and eastern redcedar
General management considerations:
• The main concerns in woodland management are the erosion hazard, the equipment limitation, and plant competition.
Suitable management practices:
• Seeding logging roads, skid trails, yarding paths, and landings to permanent plant cover helps to control erosion.
• Because of numerous coarse fragments in the surface layer and the subsoil, special planning, special equipment, or both may be required in harvesting and planting operations.
• Site preparation, such as burning, applying herbicides, and girdling or cutting unwanted trees, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• This soil is poorly suited to most residential and commercial uses because of slope and the large amount of fragments in the soil.

SeC—Sengtown gravelly silt loam, 5 to 12 percent slopes

Setting

Landscape position: Rolling ridgetops and side slopes
Shape of areas: Irregular
Size of areas: 5 to 400 acres
Major uses: Hay, pasture, and woodland

Typical Profile

Surface layer:
0 to 3 inches, yellowish brown gravelly silt loam
Subsurface layer:
3 to 9 inches, brown gravelly silt loam
Subsoil:
9 to 15 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
15 to 28 inches, yellowish red gravelly clay that has reddish mottles
28 to 60 inches, red gravelly clay that has yellowish and grayish mottles

Inclusions

• On many ridgetops are narrow strips of soils on slopes of less than 5 percent, that have a silt loam surface layer
• Areas of moderately well drained Dickson soils in saddles and in heads of drains
• Small intermingled areas of Mountview soils on convex knolls
• In the eastern part of the county, small areas of Hawthorne soils on shoulder slopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches, but some areas have isolated boulders above a depth of 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• The hazard of accelerated erosion by water can remove valuable topsoil and adversely affect rooting depth.
• In dry years the soil may be droughty and yields may be reduced.
Suitable management practices:
• Conservation practices, such as no-till and contour stripcropping, help to reduce runoff and to control erosion.
• Using a cropping system that includes grasses, legumes, or grass-legume mixtures; rotating crops;

using minimum tillage; and growing cover crops will maintain or improve tilth and increase soil moisture.
Capability class: IIIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
• Alfalfa grows well and produces good yields where adequate liming, fertilization, and other management needs are met.

Woodland

Suitability: Well suited
Trees suitable for planting: Eastern white pine, yellow-poplar, black walnut, white oak, hickory, white ash, and southern red oak
General management considerations:
• The main limitation for woodland management is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
• Slope and shrink-swell potential are limitations for dwellings and small commercial buildings.
• Low strength is a limitation for local roads and streets.
• Permeability in the subsoil and slope are limitations for septic tank absorption fields.
Suitable management practices:
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings will prevent possible structural damage to dwellings.
• Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
• Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome permeability and slope.

SeC2—Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling ridgetops in the northeastern part of the county
Shape of areas: Irregular
Size of areas: 5 to 250 acres
Major uses: Hay, pasture, and woodland

Typical Profile

Surface layer:
0 to 5 inches, yellowish brown gravelly silt loam
Subsoil:
5 to 9 inches, brown gravelly silt loam that has brownish mottles
9 to 15 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
15 to 28 inches, yellowish red gravelly clay that has reddish mottles
28 to 60 inches, red gravelly clay that has yellowish and grayish mottles

Inclusions

• Areas of moderately well drained Dickson soils in saddles
• Small, intermingled areas of Mountview soils on convex knolls
• Small areas of Hawthorne soils on shoulder slopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 5 feet, but in some areas isolated boulders are above a depth of 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• The hazard of accelerated erosion by water can remove valuable topsoil and adversely affect rooting depth.
• In dry years the soil may be droughty and yields may be reduced.

Suitable management practices:
• Conservation practices, such as no-till and contour stripcropping, help to reduce runoff and to control erosion.
• Using a cropping system that includes grasses, legumes, or grass-legume mixtures; rotating crops; using minimum tillage; and growing cover crops will maintain or improve tilth and increase soil moisture.
Capability class: IIIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Slope increases the hazard of erosion if plant stands are overgrazed or if plant stands are poor.
Suitable management practices:
• Maintain the quality and quantity of forage by rotational grazing, weed control, and annual fertilizer applications.

Woodland

Suitability: Well suited
Trees suitable for planting: Eastern white pine, yellow-poplar, black walnut, white oak, hickory, white ash, and southern red oak
General management considerations:
• The main limitation for woodland management is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Suited
General management considerations:
• Slope and shrink-swell potential are limitations for dwellings and small commercial buildings.
• Low strength is a limitation for local roads and streets.
• Permeability of the subsoil and slope are limitations for septic tank absorption fields.
Suitable management practices:
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings will prevent possible structural damage to dwellings.
• Mixing the upper part of the soil with coarser textured material will increase strength and stability of the base for roads and streets.
• Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome permeability and slope.

SeD2—Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hillsides
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major uses: Pasture and woodland

Typical Profile

Surface layer:
0 to 3 inches, yellowish brown gravelly silt loam
Subsurface layer:
3 to 5 inches, yellowish brown gravelly silt loam
Subsoil:
5 to 15 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
15 to 28 inches, yellowish red gravelly clay that has reddish mottles
28 to 60 inches, red gravelly clay that has yellowish and grayish mottles

Inclusions

• Small, intermingled areas of rock outcrops
• In the eastern part of the county, small areas of somewhat excessively drained Hawthorne soils in lower positions on hillsides
• Small areas of Minvale soils on lower footslopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches, but some areas have isolated boulders at a depth above 60 inches

Use and Management

Cropland

Suitability: Poorly suited
General management considerations:
• This soil should not be used continuously as cropland because of slope and the hazard of erosion.
Suitable management practices:
• Areas used as cropland should only be cultivated on the contour and using a rotation in which the land

remains in vegetative cover for several seasons following cultivation.
• Conservation practices, such as no-till and contour stripcropping, help to reduce runoff and to control erosion.
Capability class: IVe

Pasture and hay

Suitability: Suited
General management considerations:
• Slope increases the hazard of erosion if plant stands are overgrazed or poor.
• Pasture renovation will be needed when the better forage plants have decreased to levels less than those needed for optimum production.
Suitable management practices:
• Adjusting stocking, especially on the steeper slopes, prevents overgrazing and helps to control erosion.
• Maintain the quality and quantity of forage by rotational grazing, weed control, and annual fertilizer applications (fig. 9).

Woodland

Suitability: Well suited
Trees suitable for planting: Eastern white pine, yellow-poplar, black walnut, white oak, hickory, white ash, and southern red oak
General management considerations:
• The main limitations for woodland management are the hazard of erosion, restrictions to use of equipment, and plant competition.
Suitable management practices:
• Seeding access roads and skid trails to permanent plant cover helps to control erosion.
• Harvesting methods using wheeled and tracked vehicles may be used only during dry periods from midsummer to early fall.
• Site preparation, such as burning, herbicide, application, and girdling or cutting unwanted trees, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• Slope and shrink-swell potential are limitations for dwellings and small commercial buildings.
• Low strength and slope are limitations for roads and streets.
• Permeability in the subsoil and slope are limitations for septic tank absorption fields.

Figure 9.—Pasture management on Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded, requires annual livestock rotations and periodic forage quality improvement.

Suitable management practices:
- Proper design and construction costs are major considerations in excavating or filling sites for dwellings and small commercial buildings.
- Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings will prevent possible structural damage to dwellings.
- Laying out roads and streets in less sloping areas of the unit reduces cutting and filling; and, mixing the upper part of the soil with coarser textured material increases the strength and stability of the base of roads and streets.
- Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome permeability and slope.

SeF—Sengtown gravelly silt loam, 20 to 60 percent slopes

Setting

Landscape position: Steep hillsides
Shape of areas: Irregular
Size of areas: 10 to 100 acres
Major use: Woodland

Typical Profile

Surface layer:
0 to 3 inches, yellowish brown gravelly silt loam
Subsurface layer:
3 to 9 inches, yellowish brown gravelly silt loam
Subsoil:
9 to 15 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
15 to 28 inches, yellowish red gravelly clay that has reddish mottles
28 to 60 inches, red gravelly clay that has yellowish and grayish mottles

Inclusions

- Areas of rock outcrops along major streams
- Small areas of Minvale and Humphreys soils on narrow footslopes
- In the eastern part of the county, small areas of somewhat excessively drained Hawthorne soils in lower positions on hillsides

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches, but in some areas isolated boulders are above a depth of 60 inches

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
- This unit is unsuited to cropland because of steep slopes and the hazard of erosion.

Capability class: VIIe

Pasture and hay

Suitability: Poorly suited to hay, but some less sloping areas are suited to pasture
General management considerations:
- Steep slopes, the high rate of runoff, and the hazard of erosion are limitations for pasture management.
- Permanent vegetative cover is needed to control erosion.
- The high rate of runoff can cause a moisture deficit in late summer; and stands of less hardy plants may suffer from moisture stress.

Suitable management practices:
- Mixtures of hardy forage plants, such as tall fescue with clover or sericea lespedeza, are among the adapted forage plants.
- Reseeding the pasture may be necessary to ensure an adequate stand of desirable species for forage production and erosion control.
- Adjusting stocking, especially on the steeper slopes, prevents overgrazing and helps to control erosion.
- Pasture on slopes greater than 30 percent may be too steep for safe operation of farm equipment unless access roads are built on the contour for broadcasting seed, fertilizer, and herbicides.

Woodland

Suitability: Suited
Trees suitable for planting: Eastern white pine, yellow-poplar, black walnut, white oak, hickory, white ash, and southern red oak
General management considerations:
- The main limitations for woodland management are the hazard of erosion, the restricted use of equipment, and plant competition.

Suitable management practices:
- Steep yarding paths, skid trails, fire breaks, and landings are subject to rilling and gullying unless they are provided with adequate water bars, protected by plant cover, or both.

• Conventional wheeled and tracked equipment can be used in moderately steep areas, but more specialized harvesting methods may be required in steeper areas.
• Site preparation, such as burning, applying herbicides, and girdling or cutting unwanted trees, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• This unit is poorly suited to residential and commercial uses because of steep slopes and the hazard of erosion.

SrF—Sengtown-Rock outcrop complex, 20 to 60 percent slopes

Setting

Landscape position: Steep hillsides
Shape of areas: Long and narrow
Size of areas: 5 to 50 acres
Composition of the map unit: 50 percent Sengtown soil, 40 percent Rock outcrop, and 10 percent included soils
Major use: Woodland

Typical Profile

Sengtown

Surface layer:
0 to 3 inches, yellowish brown gravelly silt loam
Subsurface layer:
3 to 9 inches, yellowish brown gravelly silt loam
Subsoil:
9 to 15 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
15 to 28 inches, yellowish red gravelly clay that has reddish mottles
28 to 60 inches, red gravelly clay that has yellowish and grayish mottles

Rock outcrop

• In most units hard limestone bedrock is on the lower half to third of steep hillsides.

Inclusions

• Small areas of Minvale soils on narrow footslopes

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Sengtown—moderate; Rock outcrop—very slow or impermeable
Available water capacity: Sengtown—moderate; Rock outcrop—very low
Soil reaction: Sengtown—strongly acid or very strongly acid
Flood hazard: None
High water table: None
Depth to rock: Variable across the unit; Sengtown—greater than 60 inches; Rock outcrop—at the surface

Use and Management

Cropland

Suitability: Unsuited
General management considerations:
• This unit is unsuited to cropland because of steep slopes, the hazard of erosion, and hard limestone outcrops at the surface.
Capability class: Sengtown and Rock outcrop—VIIe

Pasture and hay

Suitability: Poorly suited
General management considerations:
• This unit is poorly suited to hay and pasture because of steep slopes, the hazard of erosion, and hard limestone outcrops at the surface.

Woodland

Suitability: Suited
Trees suitable for planting: Eastern white pine, yellow-poplar, black walnut, white oak, hickory, white ash, and southern red oak
General management considerations:
• Most areas are too small and difficult to manage for timber using conventional methods of harvesting, and economic returns will not likely offset the costs.
• Harvesting trees may increase the hazard of erosion.
Suitable management practices:
• High-lead or other cable logging methods are the most suitable in this unit.
• Because of steepness of slope and difficulty of access, natural reforestation of harvested areas by hardwood sprouts and seedlings is recommended.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• This unit is poorly suited to residential and commercial uses because of slope and depth to rock.

StC—Sengtown-Urban land complex, 2 to 12 percent slopes

Setting

Landscape position: Ridgetops and side slopes
Shape of areas: Irregular to rectangular
Size of areas: 100 to 500 acres
Composition of the unit: 45 percent Sengtown soil, 30 percent Urban land, 25 percent included soils
Major uses: Commercial and residential

Typical profile

Sengtown

Surface layer:
0 to 3 inches, yellowish brown gravelly silt loam
Subsurface layer:
3 to 9 inches, yellowish brown gravelly silt loam
Subsoil:
9 to 15 inches, strong brown gravelly silty clay loam that has brownish and reddish mottles
15 to 28 inches, yellowish red gravelly clay that has reddish mottles
28 to 60 inches, red gravelly clay that has yellowish and grayish mottles

Urban land

- Urban land consists of land covered by streets, buildings, parking lots, and residential areas.
- During urbanization cutting, filling, grading, and shaping altered the original soil.

Inclusions

- Areas of Nolin and Lindell soils and a few small areas of poorly drained Melvin soils on small, narrow flood plains
- Areas of Minvale and Humphreys soils on narrow footslopes
- Areas of moderately well drained Dickson and Lax soils in saddles and in heads of drainageways

Important Soil Properties and Features of the Sengtown soil

Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: None
High water table: None
Depth to rock: Greater than 60 inches, but some areas have isolated boulders above a depth of 60 inches

Use and Management

Capability class: A capability class has not been assigned to this unit.

Residential and commercial uses

Suitability: Suited
General management considerations:
- Slope and shrink-swell potential are limitations for small commercial buildings and dwellings.
- Low strength is a limitation for local roads and streets.
- Permeability in the subsoil and slope are limitations for septic tank absorption fields.

Suitable management practices:
- Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings and dwellings.
- Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings will prevent possible structural damage to dwellings and commercial buildings.
- Mixing the upper part of the soil with coarser textured material will increase the strength and stability of the base for roads and streets.
- Increasing the size of the septic tank absorption fields and placing filter lines on the contour help to overcome permeability and slope.

Su—Sullivan silt loam, occasionally flooded

Setting

Landscape position: Flood plains
Slope range: 0 to 2 percent
Shape of areas: Long and narrow
Size of areas: 10 to 50 acres
Major uses: Hay and pasture

Typical Profile

Surface layer:
0 to 7 inches, dark yellowish brown silt loam
Subsoil:
7 to 45 inches, dark yellowish brown loam that has brownish and yellowish mottles
Substratum:
45 to 60 inches, stratified dark yellowish brown sandy loam and silt loam

Inclusions

- Areas of moderately well drained Lindell soils in narrow strips below steep side slopes
- Intermingled areas of Nolin soils.

• Areas of Humphreys soils in slightly higher positions

Important Soil Properties and Features

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid to neutral
Flood hazard: Occasional, for brief periods, in winter and spring
High water table: Seasonal, at a depth of 6 feet or more, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• Most climatically adapted crops can be grown and good yields can be attained.
• Occasional flooding can damage small grain.
Suitable management practices:
• Planting crops later in the season lessens the hazard of flood damage.
• Small grain should be planted in higher areas not subject to flooding.
Capability class: IIw

Pasture and hay

Suitability: Well suited (fig. 10)
General management considerations:
• Because of flooding, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
Suitable management practices:
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, green ash, yellow-poplar, American sycamore, sweetgum, and cherrybark oak

Figure 10.—Sullivan silt loam, occasionally flooded, on narrow flood plains is well suited to pasture and hay production. The Hawthorne-Sulphura association, steep, on hillsides is suited to woodland.

General management considerations:
• The main limitation in timber management is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
• All residential and commercial uses are poorly suited because of a hazard of flooding.
Suitable management practices:
• Locating dwellings, commercial structures, and roads and streets above expected flood levels will reduce the hazard of flooding.

TrB—Tarklin gravelly silt loam, 2 to 5 percent slopes

Setting

Landscape position: Stream terraces
Shape of areas: Irregular
Size of areas: 5 to 20 acres
Major use: Pasture, hay, and woodland

Typical Profile

Surface layer:
0 to 6 inches, yellowish brown gravelly silt loam
Subsoil:
6 to 20 inches, strong brown gravelly silty clay loam
20 to 38 inches, brownish yellow gravelly silty clay loam fragipan that has brownish and grayish mottles
38 to 60 inches, light yellowish brown gravelly silt loam fragipan that has brownish and grayish mottles

Inclusions

• Intermingled areas of Byler soils
• Areas of well drained Armour soils on slightly higher, convex knolls

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan; slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid to extremely acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, at a depth of about 1.5 to 2 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Well suited
General management considerations:
• Most climatically adapted crops grow well if managed to control erosion.
• In dry summers plants may experience moisture stress because of limited available water capacity.
• Seasonal wetness in winter and spring can inhibit rooting depth and plant germination.
Suitable management practices:
• Conservation practices needed to conserve moisture, to reduce runoff, and to control erosion include rotating crops, using no-till, utilizing crop residues, and using other measures that increase organic matter content.
• Planting crops later in the season will improve plant germination and early growth.
Capability class: IIe

Pasture and hay

Suitability: Well suited
General management considerations:
• Because of seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched water table limits grazing for several days at a time in winter and early spring.
• In dry years hay yields may be moderate or low because of limited available water capacity.
Suitable management practices:
• Defer grazing until late spring through early fall.
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, yellow-poplar, white oak, southern red oak, eastern white pine, and loblolly pine
General management considerations:
• The main limitation for managing timber is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited

General management considerations:
• A seasonally perched water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
• Wetness and seepage are limitations for dwellings.
• Seasonal wetness and slope are limitations for small commercial buildings.
• Wetness is a limitation for local roads and streets.
Suitable management practices:
• Installing subsurface drains lowers the water table around areas to be used as sites for septic tank absorption fields.
• Adequate drainage is needed in planning the placement and construction of local roads and streets.
• Providing drainage and diverting surface runoff from around dwellings and small commercial buildings will reduce wetness.
• Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings.

TrC2—Tarklin gravelly silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Stream terraces
Shape of areas: Irregular
Size of areas: 5 to 20 acres
Major uses: Woodland and a few small areas in hay

Typical Profile

Surface layer:
0 to 6 inches, yellowish brown gravelly silt loam that has brownish mottles
Subsoil:
6 to 20 inches, strong brown gravelly silty clay loam
20 to 38 inches, brownish yellow very gravelly silty clay loam fragipan that has brownish and grayish mottles
38 to 60 inches, light yellowish brown very gravelly silt loam fragipan that has yellowish, brownish, and grayish mottles

Inclusions

• Intermingled areas of Byler soils

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan; slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid to extremely acid, unless the soil has been limed
Flood hazard: None
High water table: Perched, at a depth of about 1.5 to 2 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
• The hazard of accelerated erosion by water removes valuable topsoil and adversely affects rooting depth.
• Plants may experience moisture stress in dry summers because of limited available water capacity.
• Seasonal wetness in winter and spring can inhibit rooting depth and plant germination.
Suitable management practices:
• Conservation practices including minimum tillage, planting cover crops, and tilling on the contour or across the slope help to control erosion.
• Conservation practices needed to conserve moisture include rotating crops, using no-till, utilizing crop residue, and using other measures that increase organic matter content and that reduce evaporation.
• Planting crops later in the season will improve plant germination and early growth.
Capability class: IIIe

Pasture and hay

Suitability: Suited
General management considerations:
• Because of seasonal wetness, plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
• A perched seasonal water table limits grazing for several days at a time in winter and early spring.
• Hay yields may be moderate or low in dry years because of low available water capacity.
Suitable management practices:
• Defer grazing until late spring through early fall.
• Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.

Woodland

Suitability: Well suited
Trees suitable for planting: Black walnut, yellow-poplar, white oak, southern red oak, eastern white pine, and loblolly pine
General management considerations:
• The main limitation for managing timber is plant competition.
Suitable management practices:
• Site preparation, such as chopping, burning, and

applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- A perched seasonal water table and restricted permeability in the subsoil are limitations for septic tank absorption fields.
- Seasonal wetness and slope are limitations for dwellings, small commercial buildings, and local roads and streets.

Suitable management practices:
- Installing subsurface drains lowers the water table around areas to be used as sites for septic tank absorption fields.
- Installing adequate drainage is needed in planning the placement and construction of local roads and streets.
- Providing drainage and diverting surface runoff from around dwellings and small commercial buildings will reduce wetness.
- Proper design and construction costs are major considerations in excavating or filling sites for small commercial buildings.

Ud—Udarents, clayey

This map unit consists of three major areas: areas that have been filled, graded, and disturbed during urbanization; borrow pits, where the soil material has been removed and used in the construction of roadbeds or as fill material for construction sites; and sanitary landfills.

In areas that have been filled, graded, and disturbed during urbanization, in the upper 2 to 5 feet the soil material has been added or reworked. The remaining soil material generally consists of clay that has common to many fragments of gravel, cobbles, and stones.

Borrow pits commonly are excavated to a depth of 10 to 50 feet. The soil material on the steep, vertical sidewalls is comparable to that described in the lower part of the subsoil of adjacent soils. The bottom of pits in borrow areas consists of gravelly and bouldery clay.

In sanitary landfills the original soil material has been removed and filled with solid waste in alternating layers. Landfills that no longer receive waste material have been revegetated with trees or permanent grasses.

The exposed, clayey material in this unit supports plant growth. In most areas in this unit the emergent vegetative cover consists of native grasses, shrubs, and trees. Some areas have been reclaimed to stands of eastern redcedar and loblolly pine. Acidity, rooting depth in some areas, rock fragments, and the hazard of erosion are limiting features of the soil material. The areas are diverse and an on-site investigation is needed for effective planning of use and management.

This unit has not been assigned a capability class.

WfA—Wolftever silt loam, occasionally flooded

Setting

Landscape position: Low stream terraces
Slope range: 0 to 2 percent slopes
Shape of areas: Irregular and narrow
Size of areas: 5 to 25 acres
Major uses: Hay and a few small acreages of cropland

Typical Profile

Surface layer:
0 to 7 inches, brown silt loam
Subsoil:
7 to 13 inches, yellowish brown silty clay loam that has brownish mottles
13 to 26 inches, dark yellowish brown silty clay that has brownish mottles
26 to 52 inches, dark yellowish brown silty clay that has brownish and grayish mottles
52 to 60 inches, dark yellowish brown silty clay loam that has grayish and brownish mottles

Inclusions

- Areas of somewhat poorly drained Beason soils in slight depressions
- Small, narrow strips of well drained, loamy soils on natural levees of the Cumberland River

Important Soil Properties and Features

Drainage class: Moderately well drained
Permeability: Moderately slow
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, unless the soil has been limed
Flood hazard: Occasional, for very brief periods, in winter and early spring
High water table: Seasonal, at a depth of 2.5 to 3.5 feet, in winter and early spring
Depth to rock: Greater than 60 inches

Use and Management

Cropland

Suitability: Suited
General management considerations:
- Occasional flooding can damage small grain.
- Seasonal wetness can delay spring tillage and fall harvest.

Suitable management practices:
- Small grain should be grown in higher areas not subject to flooding.
- Most short-season annuals, such as soybeans or grain sorghum, grow well and can be harvested in early fall.

Capability class: IIw

Pasture and hay

Suitability: Well suited
General management considerations:
- Because of seasonal wetness and flooding, only hay and pasture plants that can tolerate short periods of wetness, such as fescue and white clover, should be seeded.
- Seasonal wetness and flooding limit grazing for several days at a time in winter and early spring.

Suitable management practices:
- Maintain the quality and quantity of forage by rotating grazing, controlling weeds, and annually applying fertilizer.
- Defer grazing until late spring through early fall.

Woodland

Suitability: Well suited
Trees suitable for planting: Yellow-poplar, black walnut, sweetgum, swamp white oak, cherrybark oak, American sycamore, and green ash
General management considerations:
- The main limitations for managing timber are seedling mortality and plant competition.

Suitable management practices:
- Seedling survival can be improved by planting larger seedlings, bedding of rows, and establishing a drainage system that will reduce seasonal wetness and divert floodwater away from plant stands.
- Site preparation, such as chopping, burning, and applying herbicides, will reduce immediate plant competition.

Residential and commercial uses

Suitability: Poorly suited
General management considerations:
- Flooding is a limitation for all residential and commercial uses.

Suitable management practices:
- Locating dwellings, commercial structures, and roads and streets in other areas above expected flood levels will reduce the hazard of flooding.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland. The loss of prime farmland to other uses results in utilization of marginal land. The use of marginal land is both costly for the user and harmful to the environment.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful (*7*). The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

This section suggests general management needed for crops and pasture. It lists the estimated yields of the main crops and pasture plants. It also explains the system of land capability classification used by the Natural Resources Conservation Service.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

The major crops grown in Dickson County are burley and dark-fired tobacco, corn, wheat, and soybeans. Grain sorghum, mainly milo, has been grown in a few areas in the southern sections of the county. Truck crops, hay crops, fruit orchards, and nursery and greenhouse plants are also important. Undulating stream terraces and bottom lands comprise most cleared land used for crop production. These areas are more desirable because of fewer equipment limitations and more available moisture for plants during dry periods. In recent years, the acreage planted to crops has been decreasing because of land use changes and agricultural legislation. Much cropland in the county has been returned to permanent grassland or has been converted to residential and commercial development.

Pasture and hay make up most of the cleared acreage in the county. Most pasture and hay consist of tall fescue and white clover. Alfalfa, lespedeza, orchardgrass, timothy, clover, and vetch are increasing in importance as hay crops.

Soil erosion is a management concern in most of the county. Loss of soil through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on such soils as Dickson, Lax, Tarklin, and Byler soils. In all these soils a layer in the subsoil limits the depth of roots. And second, controlling erosion helps to minimize the pollution of streams by sediment and improves the quality of water for municipal use, recreation, and fish and wildlife.

Erosion control practices provide surface cover, reduce runoff, and increase infiltration. A cropping

system that keeps vegetative cover on the soil surface for extended periods helps to control erosion and to maintain productivity. Contour stripcropping, diversions, grassed waterways, contour farming, and conservation tillage help to reduce runoff and to control erosion (fig. 11).

Pasture and hay are required on livestock farms. Including legumes and grass forage crops in the cropping system helps to control erosion on sloping land, provides nitrogen, and improves tilth. In most sloping areas pasture renovation is needed when forage plants have decreased to levels less than those needed for optimum production. In many steeply sloping areas adjusting stocking rates is needed to avoid overgrazing. Applying fertilizer and lime according to soil test recommendations is needed in maintaining forages. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the

Figure 11.—Growing dark-fired tobacco in rotation with tall fescue helps to control erosion. The soil is Armour silt loam, 5 to 12 percent slopes.

proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (*8*). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. Class VIII soils have not been identified in Dickson County.

Capability classes are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the table "Land Capability and Yields per Acre of Crops and Pasture."

Woodland Management and Productivity

Michael B. Huddleston, forester, Tennessee Division of Forestry, helped prepare this section.

The area now called Dickson County once was vast hardwood forest. During settlement, many areas were cleared; the timber was used as charcoal in early ironworks and as crossties for railroads. Currently, forest takes in about 57 percent of Dickson County, or nearly 179,676 acres, most of which is in small, privately owned tracts.

The deeper soils such as Sengtown and Mountview soils have the potential to produce good to excellent stands of commercial hardwoods. The steeply sloping, shallower soils, such as Hawthorne and Sulphura soils, have the potential to produce fair stands of hardwoods if aspect and species selection are carefully considered. Soils on stream terraces and bottom land also have the potential to produce excellent stands of hardwoods.

The forest tracts in Dickson County have been producing less than their full potential. On most sites

additional management practices are needed to improve productivity to its optimum potential. Suitable management practices include removing or reducing substory competition, increasing stocking rates, and planting adapted species. On many sites clearcutting and control burning will improve the stand and reduce competition. In small woodlots preventing livestock from unrestricted roaming in wooded areas helps to increase productivity and to control erosion.

The common tree species include yellow-poplar, upland and bottom land oaks, black walnut, sweetgum, maple, hickory, American sycamore, wild cherry, American beech, white ash, elm, and eastern redcedar. The county also has several small tracts of loblolly pine.

Woodland in Dickson County also has commercial value. It also provides excellent wildlife habitat, recreation potential, natural beauty, and soil and water conservation.

Table 7 can help woodland owners or forest managers plan the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed also are subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or

improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand. It can be converted to board feet by multiplying by a factor of about 5. For example, a productivity class of 114, means the soil can be expected to produce approximately 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 570 board feet per acre per year.

Suggested trees to plant are those recommended for reforestation or, if suitable conditions exist, natural regeneration. They are best suited to the soils and will produce a commercial wood crop. Desired product, topographic position (such as a low, wet area), and droughtiness of the site are three factors of many that can influence the choice of trees to use for reforestation.

Recreation

Dickson County provides opportunities for various recreational activities. The county has within its boundaries Montgomery Bell State Park, one of most visited parks in Tennessee. Dickson County is near Cheatham Wildlife Management Area, a State-controlled game preserve that is a major attraction to hunters in the area. The Cumberland River is on the northeastern edge of Dickson County. It is a major source of such aquatic recreational activities as fishing, boating, camping, hiking, sight-seeing, picnicking, and water-skiing. The Harpeth River, which meanders along the eastern edge of the county, attracts canoeists from all across Tennessee. Many other outdoor recreational activities are also available in the county. They include golf, hiking, bicycling, horseback riding, and swimming. Dickson County is close to Nashville, a large urban area, and has a high potential for further recreational development (fig. 12).

Figure 12.—Dickson County has high potential for recreation development. Mountview silt loam, 5 to 12 percent slopes, eroded, is moderately suited to golf fairways.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Dickson County has a large, varied population of fish and wildlife. The abundance and distribution of any particular species of wildlife depend on the land use, the amount of water available, and the kind of vegetative cover. Some openland species inhabit cropland, pasture, brushy fencerows, thickets, and scattered woodlots. They include cottontail, bobwhite quail, mourning dove, meadowlark, eastern bluebird, and groundhog. They are most abundant in diverse vegetative cover.

Woodland species prefer the forested ridges, hillsides, and bottomlands. They include white-tailed deer, grey and fox squirrels, wild turkey, raccoon, and a variety of nongame birds. Shallow lakes and flooded bottom lands along the Cumberland River provide breeding habitat for wood ducks and resting and feeding areas for migratory waterfowl. In the rivers, streams, lakes, and ponds of Dickson County, the populations of gamefish are large. They include crappie, sunfish, largemouth and smallmouth bass, sauger, catfish, and white bass. Nongame species are also abundant. They include shad, carp, gar, buffalo, paddlefish, snaildarter, and drum.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the

existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

Elements of Wildlife Habitat

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, grain sorghum, wheat, and oats.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are tall fescue, orchardgrass, annual lespedeza, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, panicum, carpetgrass, switchgrass, and greenbrier.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, hawthorn, dogwood, hickory, and blackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are shrub lespedeza, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and eastern redcedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to rock, wetness, surface stoniness, slope, and permeability. Shallow water areas are marshes, waterfowl feeding areas, and ponds. Examples of shallow water plants are coontail, common duckweed, spatterdock, cattail, water lily, arrowhead, and water milfoil.

Habitat for Various Kinds of Wildlife

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants.

Habitat for wetland wildlife consists of open, marshy or wooded shallow water areas.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to rock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to rock, a fragipan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories.

Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and shrinking and swelling can cause the movement of footings. A high water table, depth to rock or to a fragipan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to rock or to a fragipan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to rock or to a fragipan, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to rock or to a fragipan, and flooding affect absorption of the effluent. Large stones and bedrock or a fragipan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to rock or to a fragipan, flooding, and content of coarse fragments.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution

results if seepage is excessive or if floodwater overtops the lagoon. Slope, bedrock, and fragipans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of groundwater pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to rock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a fragipan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing estimated engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable

quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer. Depth to rock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on several factors. They include depth to rock, depth to a fragipan, or depth to other layers that affect the rate of water movement. They also include permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to rock or to a fragipan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to rock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, depth to rock, and depth to a fragipan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, depth to rock, and depth to a fragipan affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, low fertility, and restricted permeability adversely affect the growth and maintenance of the grass after construction. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer. Depth to rock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2

percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; *very high*, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water

that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in the table, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding. Water standing in swamps and marshes or in a closed depression is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the depth to the high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an

unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to rock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*9*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (*11*). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (*9*) and in "Keys to Soil Taxonomy" (*10*). Unless otherwise indicated, matrix colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Armour Series

The Armour series consists of very deep, well drained soils on stream terraces throughout the county. These soils formed in a silty mantle over gravelly alluvium or residuum derived from limestone. Slopes range from 0 to 12 percent.

Typical pedon of Armour silt loam, 2 to 5 percent slopes, gravelly substratum, 4.6 miles north of Tennessee City, 3.5 miles south of intersection of TN 46 and Maysville Road, 0.4 mile northwest of

intersection of TN 46 and Thompson Road, 25 feet west of Thompson Road, in pasture:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.
Bt1—8 to 28 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common faint clay films on faces of peds; moderately acid; clear smooth boundary.
Bt2—28 to 46 inches; strong brown (7.5YR 5/6) silty clay loam; few fine distinct brown (7.5YR 5/4) and light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; few fine iron and manganese concretions; few fine pebbles; strongly acid; clear wavy boundary.
2C—46 to 60 inches; yellowish red (5YR 4/6) very gravelly silty clay loam; few fine distinct brown (7.5YR 5/4) mottles; moderate fine and medium subangular blocky structure; firm; few distinct clay films coating fragments; about 45 percent gravel, by volume; strongly acid.

Reaction is strongly acid or moderately acid, unless the soil has been limed. Gravel ranges from 0 to 10 percent in the A and Bt horizons and from 15 to 60 percent in the 2Bt and 2C horizons. Depth to rock is greater than 5 feet.

The Ap horizon has hue of 10YR or 7.5YR, value and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. It has mottles in shades of brown or yellow. Texture is silt loam or silty clay loam.

The 2C and 2Bt horizons have hue of 7.5YR and 10YR, value of 4 or 5, and chroma of 4 or 6, or have an evenly mottled pattern in shades of red, brown, and yellow. Texture is gravelly silty clay loam, gravelly clay, or clay in pedons formed in residuum derived from limestone and ranges to very gravelly silty clay loam in pedons formed in gravelly alluvium.

Beason Series

The Beason series consists of very deep, somewhat poorly drained soils on stream terraces of the Cumberland River. These soils formed in moderately fine textured alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Beason silt loam, occasionally flooded, 2.6 miles northeast of Bellsburg, 1.6 miles northwest of intersection of TN 49 and Doziers Boat Dock Road, 0.5 mile northwest of Doziers Boat Ramp, in a field:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.
Bt1—7 to 19 inches; brown (10YR 5/3) silty clay loam; common fine faint light brownish gray (10YR 6/2), grayish brown (10YR 5/2), and few fine distinct yellowish brown (10YR 5/6) mottles; strong medium subangular blocky structure; firm; few fine roots; common prominent clay films on faces of peds; few fine dark iron and manganese concretions; strongly acid; clear smooth boundary.
Bt2—19 to 52 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; common dark iron and manganese stains and concretions; strongly acid; gradual wavy boundary.
BC—52 to 60 inches; brown (10YR 5/3) silty clay loam; common coarse distinct gray (10YR 6/1) and common fine prominent strong brown (7.5YR 5/6) mottles; moderate coarse and medium subangular blocky structure; friable; strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Depth to rock is greater than 5 feet.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 3. Texture is silt loam or silty clay loam.

The upper part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. The lower part of the Bt horizon or the Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 6. In many pedons this horizon is evenly mottled in shades of brown and gray. Texture is silty clay loam or silty clay.

The BC horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. It is mottled in shades of brown, yellow, and gray. Texture is silty clay or silty clay loam.

Byler Series

The Byler series consists of very deep, moderately well drained soils on stream terraces in the eastern section of the county. These soils formed in a silty mantle underlain by residuum derived from limestone. A dense fragipan is in the lower part of the subsoil. Slopes range from 2 to 12 percent.

Typical pedon of Byler silt loam, 2 to 5 percent slopes, eroded, 1.0 mile northwest of Harpeth Valley, 0.5 mile southeast of intersection of Gray Road and

Elnora Road, 1.4 miles northwest of intersection of TN 250 and Gray Road, 20 feet north of Gray Road, in a field:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium granular structure; very friable; common fine roots; moderately acid; clear smooth boundary.

Bt1—8 to 14 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—14 to 21 inches; yellowish brown (10YR 5/6) silty clay loam; few fine distinct pale brown (10YR 6/3) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

Btx—21 to 44 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light gray (10YR 7/2), common medium faint brownish yellow (10YR 6/6), and many coarse distinct strong brown (7.5YR 5/6) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle; few fine roots along ped faces and in seams; common distinct light gray (10YR 7/2) films of silt and clay in vertical seams; few fine dark iron and manganese concretions; few fine gravel; strongly acid; gradual wavy boundary.

2Bt—44 to 60 inches; yellowish brown (10YR 5/6) gravelly clay; common fine distinct grayish brown (10YR 5/2) and common medium distinct light yellowish brown (10YR 6/4) mottles; weak and moderate medium subangular blocky structure; firm; common prominent clay films on faces of peds and around fragments; about 30 percent, by volume, angular fragments of chert; strongly acid.

Reaction is strongly acid or moderately acid. Depth to rock is greater than 5 feet. Depth to the fragipan ranges from 18 to 30 inches. Gravel ranges from 0 to about 5 percent in the A and Bt horizons and from 0 to 35 percent in the 2Bt horizon.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It is mottled in shades of brown and gray. Texture is silt loam or silty clay loam.

The Btx horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. It is mottled in shades of yellow, brown, and gray. In some pedons the horizon is evenly mottled in shades of gray, yellow, and brown. Texture is silty clay loam and silt loam.

The 2Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 6. In some pedons it has a dominant hue of 7.5YR or 5YR. Texture is clay, silty clay, or gravelly clay.

Dickson Series

The Dickson series consists of very deep, moderately well drained soils on uplands in the central and southern sections of the county. These soils formed in a silty mantle and in residuum derived from limestone. A dense fragipan is in the lower part of the subsoil. Slopes range from 2 to 5 percent.

Typical pedon of Dickson silt loam, 2 to 5 percent slopes, 0.8 mile south of Sylvia, 1.1 miles northeast of intersection of Hortense Road and TN 235, about 900 feet southwest of intersection of TN 235 and Tucker Road, in a field:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) silt loam; few coarse faint light yellowish brown (10YR 6/4) mottles; weak medium granular structure; very friable; few fine roots; neutral; clear smooth boundary.

Bw—8 to 23 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; few dark iron and manganese concretions; strongly acid; clear smooth boundary.

Btx1—23 to 36 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct pale brown (10YR 6/3) and few fine distinct light gray (10YR 7/2) mottles; very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle; few very fine roots in vertical seams; common prominent films of silt and clay on prism faces and in vertical seams; few dark iron and manganese concretions; strongly acid; gradual wavy boundary.

Btx2—36 to 50 inches; brownish yellow (10YR 6/6) silty clay loam; common medium distinct grayish brown (10YR 5/2) and few fine prominent yellowish red (5YR 5/6) mottles; very coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle; common prominent films of clay on faces of prisms and in vertical seams; few dark iron and manganese concretions; strongly acid; gradual wavy boundary.

2Bt—50 to 60 inches; yellowish red (5YR 5/6) silty clay; common medium prominent yellowish brown (10YR 5/6) and few fine prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; common prominent clay films on faces of peds; 5 percent,

by volume, angular fragments of chert; strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Depth to the fragipan ranges from 18 to 30 inches. Gravel ranges from 0 to 10 percent in the lower part of the Btx horizon and from 0 to 35 percent in the 2Bt horizon. Depth to rock is greater than 5 feet.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam.

The Bw or Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. It is mottled in shades of yellow, brown, and gray. Texture is silt loam or silty clay loam.

The Btx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It is mottled in shades of yellow, brown, and gray. In many pedons it is evenly mottled in yellow, brown, and gray. Texture is silt loam or silty clay loam.

The 2Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 6 or 8. In many pedons it is evenly mottled in red, yellow, brown, and gray. Texture is silty clay loam, silty clay, or their gravelly analogs.

Guthrie Series

The Guthrie series consists of very deep, poorly drained soils formed in silty material on upland flats and in depressions in the central and southern sections of the county. A fragipan is in the lower part of the subsoil. Slopes range from 0 to 2 percent.

Typical pedon of Guthrie silt loam, ponded, 2.1 miles west of White Bluff, 3.5 miles northeast of intersection of U.S. 70 and Rock Church Road, 0.3 mile west of intersection of U.S. 70 and Jones Creek Road, 200 feet south of U.S. 70:

A—0 to 2 inches; brown (10YR 4/3) silt loam; common fine distinct brownish yellow (10YR 6/6) mottles; weak medium granular structure; very friable; common fine and medium roots; few dark iron and manganese concretions; few wormcasts; moderately acid; clear smooth boundary.

Eg—2 to 14 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent brownish yellow (10YR 6/6) and common coarse distinct light gray (10YR 7/2) mottles; weak fine subangular blocky structure; very friable; common fine and medium roots; common dark iron and manganese concretions; strongly acid; clear wavy boundary.

Bg—14 to 28 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct yellowish brown (10YR 5/8) and common medium distinct light brownish gray (2.5Y 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; common dark iron and manganese concretions; strongly acid; gradual wavy boundary.

Btxg1—28 to 46 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/8) and common medium faint light gray (10YR 7/1) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; few prominent films of silt and clay on faces of prisms and in vertical seams; few dark iron and manganese concretions; very strongly acid; gradual wavy boundary.

Btxg2—46 to 60 inches; gray (10YR 6/1) silty clay loam; few coarse prominent yellowish brown (10YR 5/8), common medium distinct light gray (10YR 7/2) and light brownish gray (2.5Y 6/2) mottles; weak very coarse prismatic structure parting to moderate medium subangular blocky; firm; few prominent films of silt and clay on prism faces and in vertical seams; common dark iron and manganese concretions; very strongly acid.

Reaction ranges from extremely acid to strongly acid, unless the soil has been limed. Depth to the fragipan ranges from 20 to 40 inches. Depth to rock is greater than 5 feet.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is silt loam.

The Eg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2. Texture is silt loam.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 or less. Texture is silt loam.

The Btxg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or less. It has few to common mottles in shades of yellow and brown. In some pedons it is evenly mottled in shades of yellow, gray, and brown. Texture is silt loam or silty clay loam.

Hawthorne Series

The Hawthorne series consists of moderately deep, somewhat excessively drained soils on highly dissected uplands in the eastern section of the county. These soils formed in residuum derived from interbedded siltstone and limestone. Slopes range from 5 to 60 percent.

Typical pedon of Hawthorne gravelly silt loam, 12 to 20 percent slopes, 4.5 miles southeast of Charlotte, 2.2 miles west of intersection of TN 47 and TN 250, about 0.2 mile southwest of intersection of TN 47 and Dawson Road, 25 feet north of Dawson Road, in woods:

A—0 to 2 inches; yellowish brown (10YR 5/4) gravelly

silt loam; weak medium granular structure; very friable; common fine and medium roots; about 20 percent, by volume, fragments of chert and siltstone; strongly acid; clear smooth boundary.

E—2 to 14 inches; light yellowish brown (10YR 6/4) gravelly silt loam; few fine faint pale brown mottles; weak medium granular structure; very friable; common fine and medium roots; about 33 percent, by volume, fragments of chert and siltstone; strongly acid; clear wavy boundary.

Bw—14 to 26 inches; strong brown (7.5YR 5/6) very channery silt loam; few fine distinct reddish yellow (7.5YR 6/8) and few fine prominent light yellowish brown (10YR 6/4) and yellow (10YR 7/8) mottles; weak medium subangular blocky structure; friable; few fine and medium roots matted around fragments; about 60 percent, by volume, channers of siltstone and angular fragments of chert; very strongly acid.

Cr—26 to 60 inches; alternating strata of hard siltstone interlayered with thin seams of silty clay loam.

Depth to paralithic contact ranges from 20 to 40 inches. Reaction ranges from strongly acid to extremely acid. Fragments range from 10 to 35 percent in the A and E horizons and from 35 to 60 percent in the B and C horizons. Depth to hard bedrock is greater than 5 feet.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is gravelly silt loam.

The E horizon has hue 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is gravelly silt loam.

The Bw and Bt horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It has few to many mottles in shades of brown and yellow. Texture of the fine-earth fraction is silt loam or silty clay loam.

The Cr horizon is highly fractured, horizontally bedded siltstone and chert interlayered with thin seams of silty clay loam.

Humphreys Series

The Humphreys series consists of very deep, well drained soils on footslopes and stream terraces throughout the county. These soils formed in mixed loamy colluvium and alluvium. Slopes range from 0 to 12 percent.

Typical pedon of Humphreys gravelly silt loam, 5 to 12 percent slopes, 2.3 miles southwest of Charlotte, 1.0 mile northeast of intersection of TN 48 and Ridge Road, 0.6 mile southwest of intersection of Stage Road and Choate Road, 25 feet east of Choate Road, in woods:

A—0 to 5 inches; dark brown (10YR 3/3) gravelly silt loam; weak fine granular structure; very friable; many fine and medium roots; about 15 percent, by volume, angular fragments of chert and siltstone; moderately acid; clear smooth boundary.

AB—5 to 13 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; moderate medium granular structure; very friable; many fine and medium roots; about 20 percent, by volume, fragments of chert and siltstone; moderately acid; clear smooth boundary.

Bt1—13 to 29 inches; strong brown (7.5YR 4/6) gravelly silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds and coating fragments; about 32 percent, by volume, angular fragments of chert and siltstone; strongly acid; clear wavy boundary.

Bt2—29 to 40 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; moderate medium subangular structure; friable; few fine roots between peds; few distinct clay films on faces of peds and coating fragments; about 30 percent, by volume, angular fragments of chert and siltstone; strongly acid; clear wavy boundary.

BC—40 to 46 inches; strong brown (7.5YR 5/6) gravelly silt loam; weak fine subangular blocky structure; friable; few faint clay films on faces of peds and coating fragments; about 30 percent, by volume, angular fragments of chert and siltstone; strongly acid; gradual wavy boundary.

C—46 to 60 inches; strong brown (7.5YR 4/6) very gravelly silty clay loam; weak fine subangular blocky structure; friable; about 55 percent, by volume, angular fragments of chert and siltstone; strongly acid.

Reaction ranges from very strongly acid to moderately acid, unless the soil has been limed. Coarse fragments range from 15 to 35 percent in the A and Bt horizons and from 0 to 60 percent in the BC and C horizons. Depth to rock is greater than 5 feet.

The A, AB, and Ap horizons have hue of 10YR, value of 3, and chroma of 2 to 4. Texture is gravelly silt loam.

The Bt and BC horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is gravelly silt loam or gravelly silty clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it is

mottled in shades of yellow, brown, and gray. Texture of the fine-earth fraction is silt loam or silty clay loam.

Lax Series

The Lax series consists of very deep, moderately well drained soils on uplands in the western section of the county. These soils formed in a silty mantle over gravelly alluvium and residuum derived from limestone. A dense fragipan is in the lower part of the subsoil. Slopes range from 2 to 12 percent.

Typical pedon of Lax silt loam, 5 to 12 percent slopes, 1.4 miles southwest of Tennessee City, 1.4 miles southwest of intersection of U.S. 70 and McElhiney Road, 5.1 miles northeast of intersection of East Humphreys County Line Road and County Line Road, 0.9 mile northeast of intersection of McElhiney Road and Luffman Road, 50 feet north of McElhiney Road, in woods:

A—0 to 10 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—10 to 20 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few distinct clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—20 to 24 inches; yellowish brown (10YR 5/6) silty clay loam; few medium distinct strong brown (7.5YR 5/6) and pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

2Btx—24 to 36 inches; brownish yellow (10YR 6/6) extremely gravelly silty clay loam; common medium distinct pale brown (10YR 6/3), very pale brown (10YR 7/4), and common medium prominent light brownish gray (10YR 6/2) mottles; weak very coarse prismatic structure parting to weak fine subangular blocky; firm and brittle; few fine roots in vertical seams; common prominent films of silt and clay on prism faces and in vertical seams; about 70 percent, by volume, fragments of gravel and chert; very strongly acid; gradual smooth boundary.

3Bt—36 to 60 inches; yellowish red (5YR 5/8) very gravelly silty clay; common medium prominent strong brown (7.5YR 5/6) and common fine prominent grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds and coating fragments; about 40 percent, by volume, angular fragments of chert; very strongly acid.

Reaction is very strongly acid or strongly acid, unless the soil has been limed. Depth to the fragipan ranges from 18 to 36 inches. Coarse fragments range from 0 to 15 percent in the A and Bt horizons and from 15 to 70 percent in the 2Btx and the 3Bt horizons. Depth to rock is greater than 5 feet.

The A and Ap horizons have hue of 10YR, value of 4 to 5, and chroma of 2 to 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it is mottled in shades of yellow, brown, and gray. Texture is silty clay loam or silt loam.

The 2Btx horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. It is mottled in shades of gray, yellow, brown, and red. Texture of the fine-earth fraction is silt loam or silty clay loam.

The 3Bt, or 2C horizon where present, has hue of 7.5YR to 2.5YR, value of 4 or 5, and chroma of 4 to 8. It has few to common mottles in shades of gray, yellow, brown, and red. Texture of the fine-earth fraction is silty clay or clay.

Lindell Series

The Lindell series consists of very deep, moderately well drained soils formed in loamy alluvium on narrow flood plains throughout the county. Slopes range from 0 to 3 percent.

Typical pedon of Lindell silt loam, occasionally flooded, 4.0 miles south of Charlotte, 3.5 miles south of intersection of TN 48 and TN 49, about 0.1 mile west of intersection of TN 48 and Hicks Road, 50 feet east of Hicks Road, in pasture:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine and medium roots; about 5 percent, by volume, fine gravel; neutral; clear smooth boundary.

Bw—6 to 22 inches; brown (10YR 5/3) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; common dark iron and manganese stains and concretions; about 10 percent, by volume, fine gravel; neutral; clear wavy boundary.

Bg—22 to 32 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine prominent dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine roots; about 10 percent, by volume, fine gravel; neutral; gradual wavy boundary.

BCg—32 to 48 inches; dark grayish brown (10YR 4/2) clay loam; common coarse faint brown (10YR 5/3) and common coarse distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; about 10 percent, by volume, gravel; neutral; gradual wavy boundary.

Cg—48 to 60 inches; dark grayish brown (2.5Y 4/2) gravelly loam; common medium prominent dark yellowish brown (10YR 4/4); massive; very friable; about 25 percent, by volume, gravel; neutral.

Reaction ranges from moderately acid to neutral, unless the soil has been limed. Coarse fragments range from 0 to 20 percent in the Ap horizon, from 0 to 15 percent in the Bw and Bg horizons, and from 0 to 30 percent in the Cg horizon. Depth to rock is greater than 5 feet.

The A and Ap horizons have hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is mottled in shades of gray, yellow, and brown. Texture is silt loam or silty clay loam.

The Bg and BCg horizons have hue of 10YR, value of 4 to 6, and chroma of 1 to 2. It is mottled in shades of gray and brown. Texture is silt loam, loam, silty clay loam, and clay loam.

The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Texture is silt loam, loam, silty clay loam, clay loam, or their gravelly analogs.

Melvin Series

The Melvin series consists of very deep, poorly drained soils that formed in silty alluvium on flood plains of the Cumberland River and in the southern and eastern sections of the county. Slopes range from 0 to 2 percent.

Typical pedon of Melvin silt loam, frequently flooded, 1.2 miles southeast of Burns, 1.6 miles northeast of intersection of Gum Branch Road and Garton Road, 0.8 mile northwest of intersection of Garton Road and Hogan Road, 300 feet east of Hogan Road, in a clearcut:

Ap—0 to 10 inches; light olive brown (2.5Y 5/3) silt loam; common coarse faint light brownish gray (2.5Y 6/2), common fine distinct light yellowish brown (10YR 6/4), and few fine prominent yellowish red (5YR 4/6) mottles; weak medium granular structure; very friable; many fine and medium roots; slightly acid; clear smooth boundary.

Bg1—10 to 30 inches; grayish brown (10YR 5/2) silt loam; few fine prominent yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few dark iron and manganese stains and concretions; neutral; clear wavy boundary.

Bg2—30 to 39 inches; grayish brown (10YR 5/2) silt loam; few fine prominent strong brown (7.5YR 4/6) and common medium distinct olive yellow (2.5Y 6/6) mottles; weak coarse subangular blocky structure; friable; common dark iron and manganese stains and concretions; neutral; clear wavy boundary.

Cg1—39 to 50 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct brownish yellow (10YR 6/6), few fine distinct grayish brown (2.5Y 5/2), and common medium faint gray (10YR 6/1) mottles; massive; friable; common dark iron and manganese stains and concretions; few fine gravel; neutral; gradual wavy boundary.

Cg2—50 to 60 inches; grayish brown (2.5Y 5/2) gravelly silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; massive; firm; about 20 percent, by volume, gravel; neutral.

Reaction is slightly acid or neutral. Depth to rock is greater than 5 feet.

The Ap horizon and A horizon have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 4. Texture is silt loam.

The Bg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 2 or less. It has mottles in shades of red or brown. In some pedons it has bluish-gray or greenish-gray colors. Texture is silt loam or silty clay loam.

The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 2 or less. It has mottles in shades of red or brown. In some pedons it has bluish-gray or greenish-gray colors. Texture of the fine earth fraction is silt loam, silty clay loam, or loam. In many pedons it is stratified with layers of gravel below a depth of 40 inches.

Minvale Series

The Minvale series consists of very deep, well drained soils on footslopes in the central section of the county. These soils formed in gravelly colluvium. Slopes range from 5 to 20 percent.

Typical pedon of Minvale gravelly silt loam, 5 to 12 percent slopes, 4.3 miles northwest of Charlotte, 1.4 miles west of intersection of TN 48 and Stayton Road, 0.1 mile southwest of intersection of Daniel Lane and Sweet Home Road, 50 feet northwest of Sweet Home Road, in woods:

A—0 to 6 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; weak medium granular structure; very friable; many fine and medium roots; about 20 percent, by volume, fragments of chert and siltstone; moderately acid; clear smooth boundary.

Bt1—6 to 15 inches; strong brown (7.5YR 4/6) gravelly silty clay loam; moderate medium subangular blocky structure; friable; many fine and medium roots; few faint clay films on faces of peds; about 35 percent, by volume, fragments of chert and siltstone; strongly acid; clear smooth boundary.

Bt2—15 to 30 inches; strong brown (7.5YR 4/6) gravelly silty clay loam; common medium faint strong brown (7.5YR 5/6) and few fine distinct yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; about 35 percent, by volume, angular fragments of chert and siltstone; very strongly acid; gradual wavy boundary.

Bt3—30 to 39 inches; yellowish red (5YR 5/6) gravelly silty clay loam; few fine distinct strong brown (7.5YR 5/6) and few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; few fine dark iron and manganese concretions and stains; about 30 percent, by volume, fragments of chert and siltstone; very strongly acid; gradual wavy boundary.

Bt4—39 to 60 inches; yellowish red (5YR 5/6) gravelly silty clay loam; common medium prominent light yellowish brown (10YR 6/4) and common medium faint yellowish red (5YR 5/8) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; few fine dark iron and manganese concretions and stains; about 35 percent, by volume, fragments of chert and siltstone; very strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Gravel ranges from 15 to 35 percent in each horizon. Depth to rock is greater than 5 feet.

The A and Ap horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. Texture is gravelly silt loam.

The Bt horizon has hue of 10YR to 2.5YR, value of 4 or 5, and chroma of 4 to 8. Texture is gravelly silty clay loam.

Mountview Series

The Mountview series consists of very deep, well drained soils on uplands throughout the county. These soils formed in a silty mantle over residuum of limestone. Slopes range from 2 to 12 percent.

Typical pedon to Mountview silt loam, 5 to 12 percent slopes, eroded, 3.2 miles southwest of Harpeth Valley, 2.0 miles northeast of intersection of TN 47 and TN 250, about 0.3 mile southeast of intersection of Nosegay Road and TN 250, in pasture:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

Bt1—6 to 22 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on faces of peds; strongly acid; clear smooth boundary.

2Bt2—22 to 34 inches; strong brown (7.5YR 5/6) silty clay loam; few fine prominent light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm; many prominent clay films on faces of peds; about 5 percent, by volume, angular fragments of chert; strongly acid; clear wavy boundary.

2Bt3—34 to 60 inches; red (2.5YR 4/6) clay; common medium prominent brownish yellow (10YR 6/8) and light yellowish brown (10YR 6/4) mottles; moderate medium subangular and angular blocky structure; firm; common prominent clay films on faces of peds; about 5 percent, by volume, angular fragments of chert; strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Content of coarse fragments ranges from 0 to 5 percent in the A and Bt horizons and from 5 to 35 percent in the 2Bt horizon. Depth to rock is greater than 5 feet.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. Texture is silty clay loam or silt loam.

The 2Bt horizon has hue of 7.5YR to 2.5YR, value of 4 or 5, and chroma of 4 to 6. It has few to common mottles in shades of brown, yellow, and red. Texture is silty clay loam, clay, or their gravelly analogs.

Nolin Series

The Nolin series consists of very deep, well drained soils formed in silty alluvium on flood plains throughout the county. Slopes range from 0 to 2 percent.

Typical pedon of Nolin silt loam, occasionally flooded, 1.1 miles southeast of Bellsburg, 1.6 miles southeast of intersection of TN 49 and Three Island Ford Road, 300 feet east of ford at the Harpeth River, in field:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam; few fine faint dark yellowish brown mottles; weak fine granular structure; very friable; common fine roots; slightly acid; clear smooth boundary.

Bw—5 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; few fine distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; few fine roots; neutral.

Reaction ranges from moderately acid to neutral. Depth to rock is greater than 5 feet. In some pedons buried A and B horizons are below a depth of 20 inches.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3. Texture is silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. In some pedons it has mottles in shades of brown below a depth of 24 inches. Texture is silt loam.

The C horizon, where it occurs, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam, silty clay loam, loam, or gravelly silt loam.

Saffell Series

The Saffell series consists of very deep, well drained soils on dissected uplands in the western section of the county. These soils formed in deep gravelly deposits from the Tennessee and Cumberland Rivers mixed with loamy Coastal Plain sediments. Slopes range from 12 to 60 percent.

Typical pedon of Saffell gravelly fine sandy loam, 20 to 60 percent slopes, 4.6 miles southeast of Tennessee City, 3.0 miles north of intersection of TN 48 and Oak Grove Road, 0.4 mile west of intersection of Hillcrest Road and Fielder Road, 25 feet north of Fielder Road, in woods:

A—0 to 3 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; weak medium granular structure; very friable; common fine roots; about 30 percent, by volume, rounded gravel and angular fragments of chert; strongly acid; clear smooth boundary.

E—3 to 10 inches; brown (7.5YR 4/4) gravelly fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; few faint clay films on ped faces and on fragments; about 30 percent, by volume, rounded gravel and angular chert fragments; very strongly acid; clear smooth boundary.

Bt1—10 to 30 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam; moderate medium subangular blocky structure; friable; common faint clay films on ped faces and on fragments; about 50 percent, by volume, rounded gravel; very strongly acid; clear wavy boundary.

Bt2—30 to 36 inches; strong brown (7.5YR 5/8) very gravelly sandy clay loam; few fine prominent red (2.5YR 5/8) and few fine distinct yellow (10YR 7/8) mottles; moderate medium subangular blocky structure; friable; few faint clay films on ped faces and on fragments; about 60 percent, by volume, rounded gravel; very strongly acid; gradual wavy boundary.

C—36 to 60 inches; variegated strong brown (7.5YR 5/8), brownish yellow (10YR 6/8), red (2.5YR 4/8), and yellow (10YR 7/8) gravelly sandy loam that has strata of sandy clay loam and loamy sand; massive; firm, about 30 percent, by volume, rounded gravel; very strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Fragments range from 15 to 60 percent in the A and Bt horizons and from 20 to 80 percent in the C horizon. Depth to hard bedrock is greater than 60 inches.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is gravelly fine sandy loam.

The E horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4. Texture is gravelly fine sandy loam.

The Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 to 6, and chroma of 4 to 8. Texture is very gravelly sandy clay loam, very gravelly fine sandy loam, or very gravelly clay loam.

The C horizon is variegated in shades of brown, yellow, and red. Texture is variable and commonly stratified. Texture is dominantly very gravelly sandy loam, gravelly sandy loam, and gravelly loamy sand. In some pedons it is the extremely gravelly phase of these textures.

Sengtown Series

The Sengtown series consists of very deep, well drained soils on uplands throughout the county. These

soils formed in residuum derived from gravelly limestone. Slopes range from 5 to 60 percent.

Typical pedon of Sengtown gravelly silt loam, 5 to 12 percent slopes, 1.4 miles southwest of Charlotte, 1.2 miles southwest of intersection of TN 49 and TN 48, about 0.1 mile southwest of intersection of Town Branch Road and Old Stage Road, in pasture:

Ap—0 to 3 inches; yellowish brown (10YR 5/4) gravelly silt loam; weak fine granular structure; very friable; many fine and medium roots; about 20 percent, by volume, angular fragments of chert; moderately acid; clear smooth boundary.

E—3 to 9 inches; brown (10YR 5/3) gravelly silt loam; weak medium granular structure; very friable; many fine and medium roots; about 20 percent, by volume, angular fragments of chert; strongly acid; clear smooth boundary.

Bt1—9 to 15 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; few fine prominent yellowish brown (10YR 5/4) and yellowish red (5YR 5/6) mottles; moderate fine subangular blocky structure; friable; common fine and medium roots; common distinct clay films on faces of peds; about 33 percent, by volume, angular fragments of chert; strongly acid; clear smooth boundary.

Bt2—15 to 28 inches; yellowish red (5YR 5/6) gravelly clay; common medium distinct reddish yellow (7.5YR 6/6) and common fine distinct red (2.5YR 4/6) mottles; moderate medium angular and subangular blocky structure; firm; common fine and few medium roots; many prominent clay films on faces of peds; about 30 percent, by volume, angular fragments of chert; strongly acid; clear wavy boundary.

Bt3—28 to 54 inches; red (2.5YR 4/8) gravelly clay; common fine prominent brownish yellow (10YR 6/6) and common fine distinct red (10R 4/8) mottles; moderate coarse subangular blocky structure parting to moderate medium angular and subangular blocky; firm; many prominent clay films on faces of peds; about 34 percent, by volume, angular fragments of chert; strongly acid; gradual wavy boundary.

Bt3—54 to 61 inches; red (2.5YR 4/8) gravelly clay; common medium prominent yellow (10YR 7/8) and light gray (10YR 7/2) and common medium distinct red (10R 4/8) mottles; moderate medium and coarse angular and subangular blocky structure; firm; many medium clay films on faces of peds; about 30 percent, by volume, angular fragments of chert; very strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Fragments of gravel range from 15 to 35 percent in the solum. Depth to rock is greater than 5 feet.

The Ap and A horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 4. Texture is gravelly silt loam.

The E horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The Bt horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6 in the upper part. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8 in the lower part. In some pedons in the lower part it has hue of 10R, value of 4, and chroma of 6 or 8. In the upper part texture is gravelly silty clay loam. In the lower part texture is gravelly silty clay or gravelly clay.

Sugargrove Series

The Sugargrove series consists of deep, well drained soils on uplands in the eastern section of the county. These soils formed in loamy residuum derived from siltstone and limestone. Slopes range from 5 to 12 percent.

Typical pedon of Sugargrove gravelly silt loam, in an area of Hawthorne-Sugargrove complex, 5 to 12 percent slopes, 4.75 miles east of Charlotte, 3.4 miles southeast of intersection of TN 49 and Petty Road, 2.5 miles northwest of intersection of TN 250 and Petty Road, 10 feet east of Petty Road, in pasture:

A—0 to 4 inches; brown (10YR 5/3) gravelly silt loam; weak fine granular structure; very friable; many fine roots; about 16 percent, by volume, angular fragments of chert and siltstone; neutral; clear smooth boundary.

E—4 to 15 inches; light yellowish brown (10YR 6/4) gravelly silt loam; weak medium granular structure; very friable; many fine roots; about 20 percent, by volume, angular fragments of chert and siltstone; strongly acid; clear smooth boundary.

Bt1—15 to 29 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common faint clay films on ped faces and on fragments; about 20 percent, by volume, angular fragments of chert and channers of siltstone; very strongly acid; gradual smooth boundary.

Bt2—29 to 45 inches; strong brown (7.5YR 5/6) channery silty clay loam; few fine distinct light yellowish brown (10YR 6/4) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots between fragments; common distinct clay films on ped faces and on fragments; about 35 percent, by

volume, channers of siltstone; very strongly acid; abrupt wavy boundary.

Cr—45 to 60 inches; horizontally bedded, highly fractured siltstone; thin strata of silty clay loam between and coating fragments.

Reaction is strongly acid or very strongly acid, unless the soils have been limed. Fragments range from 10 to 35 percent within the control section. Depth to paralithic contact ranges from 40 to 60 inches. Depth to hard bedrock is greater than 60 inches.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6. Texture is gravelly silt loam.

In the upper part the Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 6. In some pedons it has mottles in shades of red or brown. In the lower part it has hue of 10YR, 7.5YR, or, in a few pedons, 5YR; value of 4 to 6; and chroma of 5 or 6; and is mottled in shades of red or brown. In the upper part texture is gravelly silt loam or gravelly silty clay loam. In the lower part texture is channery silty clay loam or very channery silty clay loam.

The Cr horizon consists of highly fractured, horizontally bedded siltstone and chert interlayered with thin strata of silty clay loam.

Sullivan Series

The Sullivan series consists of very deep, well drained soils formed in medium textured alluvium on narrow flood plains throughout the county. Slopes range from 0 to 2 percent.

Typical pedon of Sullivan silt loam, occasionally flooded, 4.3 miles southeast of Charlotte, 4.2 miles southeast of intersection of TN 48 and TN 47, about 0.6 mile northwest of intersection TN 47 and Rouse Road, 700 feet southwest of Jones Creek Bridge, in pasture:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; common fine roots; neutral; clear smooth boundary.

Bw—7 to 45 inches; dark yellowish brown (10YR 4/4) loam; few fine distinct brownish yellow (10YR 6/6) mottles; weak fine and medium subangular blocky structure; friable; few fine roots; neutral; clear smooth boundary.

C—45 to 60 inches; dark yellowish brown (10YR 4/4) sandy loam that has strata of silt loam; common medium faint brown (10YR 4/3) mottles; weak fine subangular blocky structure; few fine gravel; neutral.

Reaction ranges from moderately acid to neutral. Coarse fragments range from 0 to 10 percent in the Ap and Bw horizons and range from 15 to 50 percent in the C horizon. Depth to rock is greater than 5 feet.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 to 4. Texture is silt loam or loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam, loam, or fine sandy loam.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 4. In some pedons it has common mottles in shades of yellow or brown. Texture is sandy loam, silt loam, loam, or their gravelly analogs. Many pedons are stratified.

Sulphura Series

The Sulphura series consists of moderately deep, somewhat excessively drained soils on highly dissected uplands in the eastern section of the county. These soils formed in mixed residuum derived from siltstone, limestone, and shale. Slopes range from 20 to 60 percent.

Typical pedon of Sulphura gravelly silt loam, in an area of Hawthorne-Sulphura association, steep, 4.5 miles southeast of Charlotte, 2.3 miles west of intersection of TN 47 and TN 250, about 0.3 mile southwest of intersection of TN 47 and Dawson Road, 100 feet west of Dawson Road, in woods:

A—0 to 6 inches; dark brown (10YR 3/3) gravelly silt loam; weak fine granular structure; very friable; common fine and medium roots; about 25 percent, by volume, angular fragments of chert; moderately acid; clear smooth boundary.

AB—6 to 12 inches; brown (10YR 4/3) channery silt loam; few medium faint yellowish brown (10YR 5/4) and common medium faint dark brown (10YR 3/3) mottles; weak medium granular structure; very friable; common medium and fine roots; about 25 percent, by volume, channers of siltstone and angular fragments of chert; moderately acid; clear smooth boundary.

Bw—12 to 22 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine subangular blocky structure; friable; few fine and medium roots between peds and around fragments; about 60 percent, by volume, channers of siltstone; moderately acid; gradual wavy boundary.

R—22 inches; hard, gray bedrock.

Reaction ranges from strongly acid or moderately acid in the upper part of the profile and from strongly acid to slightly acid in the lower part. Rock fragments range from 10 to 25 percent in the A and AB horizons

and from 35 to 60 percent in the Bw horizon. Depth to hard bedrock ranges from 20 to 40 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Texture is gravelly silt loam or channery silt loam.

The AB horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is gravelly silt loam or channery silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is very channery silt loam or very channery silty clay loam.

The Cr horizon, where present, is horizontally bedded, highly fractured siltstone.

The R layer is hard, limestone bedrock.

Tarklin Series

The Tarklin series consists of very deep, moderately well drained soils on stream terraces in the eastern section of the county. These soils formed in mixed loamy alluvial and colluvial sediments. A dense fragipan is in the lower part of the subsoil. Slopes range from 2 to 12 percent.

Typical pedon of Tarklin gravelly silt loam, 5 to 12 percent slopes, eroded, 5.0 miles southeast of Charlotte, 2.5 miles southwest of intersection of TN 47 and TN 250, about 0.6 mile south of intersection of TN 47 and Dawson Road, 25 feet west of Dawson Road, in pasture:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) gravelly silt loam; few fine distinct strong brown (7.5YR 5/6); weak fine granular structure; very friable; many fine and medium roots; about 30 percent, by volume, angular fragments of chert and siltstone; strongly acid; clear smooth boundary.

Bt1—6 to 20 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; moderate medium subangular blocky structure; friable; common fine and medium roots; few faint clay films on faces of peds; few fine iron and manganese concretions and stains; about 30 percent, by volume, angular fragments of chert and siltstone; strongly acid; clear smooth boundary.

Btx1—20 to 38 inches; brownish yellow (10YR 6/6) gravelly silty clay loam; common coarse distinct light yellowish brown (10YR 6/4), common coarse prominent strong brown (7.5YR 5/8), and common medium distinct light gray (10YR 7/2) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm, brittle; few very fine roots in vertical seams; thin light gray (10YR 7/2) coatings of silt and clay on prism faces and in vertical and horizontal seams; few fine iron and manganese concretions; about 35 percent, by volume, chert and siltstone fragments; very strongly acid; gradual wavy boundary.

Btx2—38 to 60 inches; light yellowish brown (10YR 6/4) gravelly silt loam; common medium distinct light gray (10YR 7/2) and common medium prominent strong brown (7.5YR 5/8) mottles; very coarse prismatic structure parting to moderate medium subangular blocky; very firm, brittle; thin light gray (10YR 7/2) coatings of silt and clay on prism faces and in vertical and horizontal seams; few fine iron and manganese concretions; about 35 percent, by volume, chert and siltstone fragments; very strongly acid.

Reaction is extremely acid to strongly acid, unless the soil has been limed. Depth to the fragipan ranges from 18 to 30 inches. Gravel ranges from 15 to 35 percent in the A, Bt, and Btx horizons and from 25 to 70 percent in the C horizon, where it occurs. Depth to rock is greater than 5 feet.

The Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Texture is gravelly silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value and chroma of 4 to 6. In some pedons in the lower part it has mottles in shades of brown and gray. Texture is gravelly silt loam or gravelly silty clay loam.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. It is mottled in shades of gray and brown. Texture is gravelly silt loam or gravelly silty clay loam.

Wolftever Series

The Wolftever series consists of very deep, moderately well drained soils on stream terraces of the Cumberland River. These soils formed in fine textured alluvium. Slopes range from 0 to 2 percent.

Typical pedon of Wolftever silt loam, occasionally flooded, 2.5 miles northeast of Bellsburg, 1.3 miles northwest of the intersection of TN 49 and Dozier's Boat Dock Road, 0.7 mile west of the intersection of Dozier's Boat Dock and Tennessee Wildlife Resources Agency access road, in a field:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine roots; slightly acid; clear smooth boundary.

Bt1—7 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint pale brown mottles; moderate medium subangular blocky structure; friable; few fine roots; common distinct clay films on faces of peds; moderately acid; clear smooth boundary.

Bt2—13 to 26 inches; dark yellowish brown (10YR 4/4) silty clay; few medium distinct light yellowish brown (2.5Y 6/4) mottles; strong medium subangular blocky structure; firm; few fine roots; many prominent clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—26 to 52 inches; dark yellowish brown (10YR 4/4) silty clay; common medium prominent light brownish gray (2.5Y 6/2) and few fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; common dark iron and manganese concretions and stains; strongly acid; gradual wavy boundary.

BC—52 to 60 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and few fine distinct light yellowish brown (10YR 6/4) mottles; weak and moderate medium subangular blocky structure; friable; few faint clay films on ped faces; few dark iron and manganese concretions and stains; strongly acid.

Reaction is strongly acid or very strongly acid, unless the soil has been limed. Depth to rock is greater than 5 feet.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value and chroma of 4 or 6. It is mottled in shades of brown, yellow, and gray. Texture is silty clay or silty clay loam.

The BC horizon has the same colors as the Bt horizon or is evenly mottled in brown, gray, and yellow. Texture is silty clay loam or silt loam.

Formation of the Soils

Factors of Soil Formation

The five factors of soil formation are parent material, time, climate, topography, and living organisms (*4*). The combined influence of these factors determines the characteristics and properties of a soil.

Parent Material

Parent material is the unconsolidated mass from which a soil develops. The character of this mass affects the kind of profile that develops and the degree of development. The parent material in Dickson County comprises mixtures of loess (windblown silt), residuum derived from limestone and siltstone, mixtures of gravelly deposits of the Tennessee and Cumberland Rivers and loamy Coastal Plain sediments, colluvium, and alluvium (recently deposited material).

A silty mantle caps most uplands in the county. It ranges from 2 feet to several inches in depth. The upper part of Dickson, Mountview, and Guthrie soils formed in this parent material. The lower part of these soils formed in fine textured residuum derived from limestone. Sengtown soils formed in gravelly residuum derived from limestone. Hawthorne and Sulphura soils on steep hillsides formed in loamy material derived from siltstone and limestone. In these soils the profile is less developed than that of Sengtown soils. Saffell soils formed in mixed gravelly deposits from the Tennessee and Cumberland Rivers and in loamy marine sediments.

Several soils on stream terraces formed in mixed silty material and alluvium. They include Byler, Armour, Wolftever, Humphreys, and Tarklin soils. Minvale soils formed in colluvium on footslopes. The least developed soils in the county formed in recent alluvium deposited by streams or washed from uplands. They are Nolin, Sullivan, Lindell, and Melvin soils.

Time

The soils in Dickson County vary considerably in age. Generally, profile development reflects the length of soil formation. Older soils generally have better defined horizons than younger soils.

The effects of time as a soil-forming factor are more apparent in the central section of Dickson County. Dickson, Mountview, and Sengtown soils dominate the undulating ridges and steep side slopes. They exhibit significant profile development. Slightly younger soils characterize the eastern and western sections of the county. They include Hawthorne, Sulphura, and Saffell soils on steep hillsides. Byler and Armour soils, of intermediate age, formed in silty material deposited on stream terraces. The youngest soils, such as Nolin and Sullivan soils, formed on flood plains in recent alluvium washed from streams and uplands. They are still acquiring new material and have not been in place long enough to develop distinct horizons.

Climate

Climate is a factor of soil formation primarily through the influence of precipitation and temperature. Climate affects the physical, chemical, and biological relationships in the soil. These relationships are a strong influence on rates of soil weathering, erosion, and decomposition of organic matter. The amount of leaching of nutrients in a soil is also related to the amount of rainfall and movement of water through the soil. The effects of climate also control the kinds of plants and animals that can thrive in a region. Temperature influences the kind and growth of organisms and the speed of chemical and physical reactions in a soil.

The climate of Dickson County is warm and humid. It is characteristic of the climate of the southeastern part of the United States. It varies so little within the county so as not to cause differences in soils. Its mild temperatures and abundant rainfall cause intense leaching of soluble and colloidal materials and rapid decomposition of organic matter. As these translocated materials move downward in the soil, some accumulate in the lower layers and others move out of the soil. Generally, the older, well developed soils in Dickson County are low in natural fertility and more weathered, leached, and acid than younger soils.

Topography

Topography includes relief, slope, landform, and aspect. It influences or modifies the effects of the other soil-forming factors. Steepness, shape, and length of slope directly influence the rates of infiltration and runoff. The greater the runoff, the more erosion, other factors being equal.

In many areas the steeper slopes result from rapid downcutting by stream action, which exposes the parent material to soil-forming factors. In these sloping areas, the profiles are undergoing development and have not reached the maturity of soils on more stable landscapes.

In areas below the steeper side slopes, the soils formed as a result of various forms of mass wasting, such as creep, soil flow, and slump. In these areas the soils have a loamy profile of intermediate age, because they formed from soils and parent materials on adjacent landscapes.

Concave slopes tend to concentrate water; thus, on gentler slopes more water infiltrates the soil. Free water, moving downward through many local soil profiles, is trapped or perched above a relatively impermeable layer, or fragipan. The water stands for days or weeks or, in some places, moves away in lateral directions. Periodically, fresh sediment washed from adjacent uplands or from stream overflow covers soils on flood plains. Repeated deposition of sediment results in stratified soils that have minimum profile development.

Living Organisms

Plants and animals, both large and small, are active forces in soil formation. Living organisms transfer soil material in many ways from below ground to above. When a tree falls, for example, the roots bring soil to the surface. Ants and crayfish construct mounds that generally contain material from the subsoil. Living animals and plants blend soil components into a uniform mixture. Plant roots break up stratified sediments and dislodge rock fragments. Microscopic organisms contribute to the chemistry in the soil; they are essential for plant growth and survival. Old rootholes provide channels for air and water.

Decaying plants release nutrients and organic acids. Living roots absorb water and nutrients, increase carbon dioxide levels, lower oxygen levels, and increase acidity.

Living organisms also affect the color of soils. Well drained soils are red, yellow, or brown; poorly drained soils are gray. Yellow and brown iron and manganese compounds coat mineral grains. When the soil is saturated, roots and micro-organisms use oxygen faster than it is replenished. Consequently, some iron compounds dissolve and translocate downward. Manganese compounds become indurated; small nodules and concretions develop. Mineral grains lose their coatings and turn gray. Gray mottles form at the uppermost depth of the high water table.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	less than 3.0
Low	2.0 to 4.0
Moderate	4.0 to 6.0
High	more than 6.0

Backslope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees

generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not

invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Creep. An imperceptible and nonaccelerating downslope movement of soil material and rock.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic).—Erosion caused by geologic

processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated).—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Head out. To form a flower head.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or

lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the

movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra	less than 3.5
Extremely acid	3.4 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building

foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for complex slopes are as follows:

Nearly level	0 to 2 percent
Undulating	2 to 5 percent
Rolling	5 to 12 percent
Hilly	12 to 20 percent
Steep	20 to 60 percent
Very steep	60 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil flow. A result of excessive rainfall and oversaturation of soil material on hillsides or on tow slopes, most often developing at the heads of streams.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single*

grained (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. The straight segment of a slope below a free face, consisting of rock fragments from the free face and upper slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a footslope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so

much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1951-87 at Dickson, Tennessee)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	45.9	26.4	36.2	72	5	30	4.46	1.88	6.34	7	2.7
February	51.3	29.5	40.4	76	2	40	4.40	2.44	5.64	7	2.9
March	60.8	37.4	49.1	84	15	139	5.49	3.09	7.52	8	1.5
April	72.3	47.0	59.7	88	27	302	4.99	2.93	6.60	8	.1
May	79.6	55.0	67.3	92	35	536	4.91	2.15	7.17	8	.0
June	86.5	62.8	74.7	97	46	741	3.92	1.98	5.57	7	.0
July	89.9	66.9	78.4	100	54	880	4.24	1.90	6.19	7	.0
August	89.0	65.6	77.3	99	53	846	3.55	1.46	5.25	6	.0
September	82.9	59.2	71.1	97	40	633	3.60	1.61	5.32	5	.0
October	72.0	47.4	59.7	89	27	316	2.97	1.27	4.31	5	.0
November	59.5	38.0	48.8	81	15	74	4.69	2.38	6.65	6	.4
December	50.2	30.7	40.5	72	4	34	4.90	2.04	7.05	7	1.3
Yearly:											
Average	70.0	47.2	58.6	---	---	---	---	---	---	---	---
Extreme	---	---	---	101	4	---	---	---	---	---	---
Total	---	---	---	---	---	4,571	52.12	43.91	59.43	81	8.9

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1951-87 at Dickson, Tennessee)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 18	Apr. 23	Apr. 27
2 years in 10 later than--	Apr. 12	Apr. 18	May 22
5 years in 10 later than--	Mar. 31	Apr. 9	Apr. 14
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 28	Oct. 23	Oct. 2
2 years in 10 earlier than--	Nov. 2	Oct. 27	Oct. 9
5 years in 10 earlier than--	Nov. 13	Nov. 3	Oct. 22

Table 3.--Growing Season

(Recorded in the period 1951 87 at Dickson, Tennessee)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	202	197	174
8 years in 10	211	201	160
5 years in 10	226	206	190
2 years in 10	242	212	200
1 year in 10	251	215	206

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
ArA	Armour silt loam, 0 to 2 percent slopes, gravelly substratum, occasionally flooded	3,816	1.2
ArB	Armour silt loam, 2 to 5 percent slopes, gravelly substratum	6,030	1.9
ArC	Armour silt loam, 5 to 12 percent slopes	5,184	1.6
Be	Beason silt loam, occasionally flooded	131	*
ByB2	Byler silt loam, 2 to 5 percent slopes, eroded	1,829	0.6
ByC2	Byler silt loam, 5 to 12 percent slopes, eroded	758	0.2
DkB	Dickson silt loam, 2 to 5 percent slopes	6,359	2.0
Gu	Guthrie silt loam, ponded	789	0.3
HaD	Hawthorne gravelly silt loam, 12 to 20 percent slopes	1,355	0.4
HgC	Hawthorne-Sugargrove complex, 5 to 12 percent slopes	3,573	1.1
HsF	Hawthorne-Sulphura association, steep	34,454	11.0
HuA	Humphreys gravelly silt loam, 0 to 2 percent slopes, occasionally flooded	2,637	0.8
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes	4,520	1.4
HuC	Humphreys gravelly silt loam, 5 to 12 percent slopes	2,149	0.7
LaB	Lax silt loam, 2 to 5 percent slopes	3,498	1.1
LaC	Lax silt loam, 5 to 12 percent slopes	10,445	3.3
Ld	Lindell silt loam, occasionally flooded	2,197	0.7
Me	Melvin silt loam, frequently flooded	492	0.2
MnC	Minvale gravelly silt loam, 5 to 12 percent slopes	3,076	1.0
MnD	Minvale gravelly silt loam, 12 to 20 percent slopes	569	0.2
MtB	Mountview silt loam, 2 to 5 percent slopes	4,608	1.5
MtC2	Mountview silt loam, 5 to 12 percent slopes, eroded	5,377	1.7
No	Nolin silt loam, occasionally flooded	2,251	0.7
Pq	Pits, quarry	118	*
Rc	Rock outcrop, very steep	2,144	0.7
SaD	Saffell gravelly fine sandy loam, 12 to 20 percent slopes	5,798	1.8
SaF	Saffell gravelly fine sandy loam, 20 to 60 percent slopes	8,706	2.8
SeC	Sengtown gravelly silt loam, 5 to 12 percent slopes	67,800	21.6
SeC2	Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded	5,615	1.8
SeD2	Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded	44,479	14.1
SeF	Sengtown gravelly silt loam, 20 to 60 percent slopes	58,878	18.7
SrF	Sengtown-Rock outcrop complex, 20 to 60 percent slopes	4,189	1.3
StC	Sengtown-Urban land complex, 2 to 12 percent slopes	6,163	2.0
Su	Sullivan silt loam, occasionally flooded	2,167	0.7
TrB	Tarklin gravelly silt loam, 2 to 5 percent slopes	166	0.1
TrC2	Tarklin gravelly silt loam, 5 to 12 percent slopes, eroded	1,015	0.3
Ud	Udarents, clayey	486	0.2
WfA	Wolftever silt loam, occasionally flooded	279	0.1
	Water	500	0.2
	Total	314,600	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
ArA	Armour silt loam, 0 to 2 percent slopes, gravelly substratum, occasionally flooded
ArB	Armour silt loam, 2 to 5 percent slopes, gravelly substratum
Be	Beason silt loam, occasionally flooded
ByB2	Byler silt loam, 2 to 5 percent slopes, eroded
DkB	Dickson silt loam, 2 to 5 percent slopes
HuA	Humphreys gravelly silt loam, 0 to 2 percent slopes, occasionally flooded
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes
LaB	Lax silt loam, 2 to 5 percent slopes
Ld	Lindell silt loam, occasionally flooded
MtB	Mountview silt loam, 2 to 5 percent slopes
No	Nolin silt loam, occasionally flooded
Su	Sullivan silt loam, occasionally flooded
TrB	Tarklin gravelly silt loam, 2 to 5 percent slopes
WfA	Wolftever silt loam, occasionally flooded

Table 6.--Land Capability Classes and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Grain sorghum	Wheat	Alfalfa hay	Tall fescue-ladino
		Bu	Bu	Lbs	Bu	Bu	Tons	AUM*
ArA---- Armour	IIw	120	50	2,900	115	40	---	9.0
ArB---- Armour	IIe	110	45	2,800	105	45	4.0	8.5
ArC---- Armour	IIIe	100	35	2,600	95	40	3.5	8.0
Be---- Beason	IIw	70	35	---	75	---	---	6.5
ByB2---- Byler	IIe	80	35	2,500	75	45	---	7.5
ByC2---- Byler	IIIe	70	30	2,300	65	35	---	6.5
DkB---- Dickson	IIe	85	35	2,700	80	40	---	7.5
Gu---- Guthrie	Vw	---	---	---	---	---	---	---
HaD---- Hawthorne	VIs	---	---	---	---	---	---	3.5
HgC---- Hawthorne-Sugargrove	IVs	---	---	---	---	---	---	4.5
HsF**:								
Hawthorne----	VIIs	---	---	---	---	---	---	---
Sulphura----	VIIs	---	---	---	---	---	---	---
HuA---- Humphreys	IIw	95	35	2,300	90	40	---	7.0
HuB---- Humphreys	IIe	85	32	2,200	80	45	3.5	8.0
HuC---- Humphreys	IIIe	75	30	2,000	70	35	3.0	7.5
LaB---- Lax	IIe	80	30	2,200	---	40	---	---
LaC---- Lax	IIIe	75	25	1,900	70	35	---	5.5
Ld---- Lindell	IIw	110	40	---	105	45	---	7.5
Me---- Melvin	IVw	---	25	---	---	---	---	---

See footnotes at end of table.

Table 6.--Land Capability Classes and Yields per Acre of Crops and Pasture Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Grain sorghum	Wheat	Alfalfa hay	Tall fescue-ladino
		Bu	Bu	Lbs	Bu	Bu	Tons	AUM*
MnC---------- Minvale	IIIe	75	30	2,000	70	40	3.5	7.5
MnD---------- Minvale	IVe	---	---	---	---	30	---	6.5
MtB ---------- Mountview	IIe	100	40	2,800	95	50	4.0	8.5
MtC2---------- Mountview	IIIe	90	35	2,600	85	45	3.5	8.0
No---------- Nolin	IIw	120	45	---	115	---	---	9.0
Pq**. Pits, quarry								
Rc**. Rock outcrop								
SaD---------- Saffell	VIs	---	---	---	---	---	---	3.5
SaF---------- Saffell	VIIs	---	---	---	---	---	---	---
SeC---------- Sengtown	IIIe	90	35	2,300	85	45	3.5	8.0
SeC2---------- Sengtown	IIIe	85	30	2,000	---	42	3.0	7.5
SeD2---------- Sengtown	IVe	---	---	--	-	35	3.0	7.0
SeF---------- Sengtown	VIIe	---	---	---	---	---	---	5.0
SrF**---------- Sengtown-Rock outcrop	VIIe	---	---	---	---	---	---	---
StC**. Sengtown-Urban land								
Su---------- Sullivan	IIw	115	45	---	110	---	---	8.0
TrB---------- Tarklin	IIe	90	18	2,300	---	40	---	---
TrC2---------- Tarklin	IIIe	70	35	2,000	65	35	---	6.0
Ud**. Udarents								

See footnotes at end of table.

Table 6.--Land Capability Classes and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Grain sorghum	Wheat	Alfalfa hay	Tall fescue-ladino
		Bu	Bu	Lbs	Bu	Bu	Tons	AUM*
WfA---------- Wolftever	IIw	80	35	---	75	- -	---	7.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Wind throw hazard	Plant competition	Common trees	Site index	Volume	
ArA, ArB-------- Armour	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------- American sycamore--- American elm--------	90 85 ---	86 86 ---	Yellow-poplar, loblolly pine, black walnut, white oak, southern red oak, eastern white pine, hickory.
ArC---------- Armour	Slight	Slight	Slight	Slight	Moderate	Northern red oak---- White oak---------- Yellow-poplar-------- Loblolly pine-------	70 70 90 77	57 57 86 100	Yellow-poplar, black walnut, loblolly pine, white oak, eastern white pine, southern red oak, hickory.
Be---------- Beason	Slight	Moderate	Moderate	Slight	Moderate	Yellow-poplar-------- Sweetgum---------- White oak---------- Southern red oak---- Loblolly pine-------	90 80 70 70 80	86 86 57 57 114	Sweetgum, yellow-poplar American sycamore, swamp white oak, green ash, cherrybark oak, pin oak.
ByB2, ByC2------ Byler	Slight	Slight	Slight	Moderate	Moderate	Yellow-poplar-------- Southern red oak---- Loblolly pine-------	90 70 80	86 57 114	Yellow-poplar, white oak, southern red oak, loblolly pine, eastern white pine, black walnut.
DkB---------- Dickson	Slight	Slight	Slight	Moderate	Moderate	Yellow-poplar-------- White oak---------- Loblolly pine-------	92 73 80	86 57 114	Loblolly pine, eastern white pine, white oak, yellow-poplar, southern red oak.
Gu---------- Guthrie	Slight	Severe	Severe	Moderate	Severe	Sweetgum---------- Willow oak----------	90 85	100 86	Sweetgum, American sycamore, yellow-poplar, willow oak, swamp white oak, cherrybark oak.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume	
HaD---------- Hawthorne	Slight	Moderate	Moderate	Slight	Moderate	Southern red oak----	60	43	Eastern redcedar, white oak, mockernut hickory, chestnut oak, Virginia pine.
						Shortleaf pine------	60	86	
						Mockernut hickory---	---	---	
HgC**:									
Hawthorne------	Slight	Slight	Moderate	Slight	Moderate	Southern red oak----	60	3	Mockernut hickory, chestnut oak, Virginia pine.
						Shortleaf pine------	60	6	
						Mockernut hickory---	---	---	
Sugargrove-----	Slight	Slight	Slight	Slight	Moderate	Southern red oak----	60	43	Eastern redcedar, white oak, mockernut hickory, chestnut oak, Virginia pine.
						Shortleaf pine------	60	86	
						Virginia pine-------	60	86	
HsF**:									
Hawthorne -----	Moderate	Severe	Moderate	Slight	Moderate	Southern red oak----	60	43	Eastern redcedar, white oak, mockernut hickory chestnut oak, Virginia pine.
						Shortleaf pine------	60	86	
						Mockernut hickory---	---	---	
Sulphura-------	Severe	Severe	Moderate	Moderate	Moderate	Loblolly pine-------	65	86	Eastern redcedar, white oak, mockernut hickory, chestnut oak, Virginia pine.
						Shortleaf pine------	55	72	
						Eastern redcedar----	35	29	
HuA, HuB, HuC--- Humphreys	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	100	114	Yellow-poplar, white oak, white ash, black walnut, hickory, sweetgum, loblolly pine.
						Northern red oak----	70	57	
						Shortleaf pine------	70	114	
						Loblolly pine- -----	90	129	
						Black walnut--------	---	---	
LaB-------- --- Lax	Slight	Slight	Slight	Moderate	Moderate	Southern red oak----	70	57	White oak, southern red oak, chestnut oak, hickory, eastern redcedar, Virginia pine.
						Loblolly pine-------	80	114	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume	
LaC--Lax	Moderate	Slight	Slight	Moderate	Moderate	Southern red oak	70	57	White oak, southern red oak, chestnut oak, hickory, eastern redcedar, Virginiapine.
						Loblolly pine	80	114	
Ld--Lindell	Slight	Slight	Moderate	Slight	Severe	Yellow-poplar	100	114	Yellow-poplar, black walnut, American sycamore, sweetgum, cherrybark oak.
						Northern red oak	80	57	
						Loblolly pine	90	129	
						Sweetgum	90	100	
Me--Melvin	Slight	Moderate	Moderate	Severe	Severe	Pin oak	99	100	Pin oak, green ash, cherrybark oak, American sycamore, swamp white oak, sweetgum, shagbark hickory, willow oak.
						Sweetgum	89	100	
						Green ash	---	---	
						Hickory	---	---	
						Cherrybark oak	---	114	
MnC--Minvale	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar	90	86	Yellow-poplar, hickory, eastern redcedar, loblolly pine.
						White oak	70	57	
						Shortleaf pine	70	114	
						Loblolly pine	80	114	
						Virginia pine	70	114	
MnD--Minvale	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar	90	86	Yellow-poplar, white oak, southern red oak, hickory, eastern redcedar, loblolly pine.
						White oak	70	57	
						Shortleaf pine	70	114	
						Loblolly pine	80	114	
						Virginia pine	70	114	
MtB--Mountview	Slight	Slight	Slight	Slight	Moderate	Southern red oak	70	57	Yellow-poplar, white oak, southern red oak, hickory, eastern white pine.
						Yellow-poplar	90	86	
						Shortleaf pine	65	100	
MtC2--Mountview	Moderate	Slight	Slight	Slight	Moderate	Southern red oak	70	57	Yellow poplar, white oak, southern red oak, hickory, eastern white pine.
						Yellow-poplar	90	86	
						Shortleaf pine	65	100	

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume	
No Nolin	Slight	Slight	Slight	Slight	Severe	Yellow-poplar Sweetgum Cherrybark oak Black walnut American sycampre	107 92 97 --- ---	8 8 10 --- ---	Yellow-poplar, American sycamore, white ash, cherrybark oak, sweetgum, black walnut.
SaD Saffell	Moderate	Moderate	Slight	Slight	Moderate	Loblolly pine Shortleaf pine White oak	68 60 ---	86 86 ---	White oak, chestnut oak, Virginia pine, mockernut hickory, eastern redcedar.
SaF Saffell	Severe	Severe	Slight	Slight	Moderate	Loblolly pine Shortleaf pine White oak	68 60 --	86 86 ---	White oak, chestnut oak, Virginia pine, mockernut hickory, eastern redcedar.
SeC, SeC2 Sengtown	Slight	Slight	Slight	Slight	Moderate	Southern red oak Yellow-poplar Shortleaf pine	70 90 70	57 86 114	Yellow-poplar, eastern white pine, black walnut, white oak, hickory, white ash, southern red oak.
SeD2 Sengtown	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak Yellow-poplar Shortleaf pine	70 90 70	57 86 114	Yellow poplar, eastern white pine, black walnut, white oak, hickory, white ash, southern red oak.
SeF Sengtown	Severe	Severe	Slight	Slight	Moderate	Southern red oak Yellow-poplar Shortleaf pine	70 90 70	57 86 114	Yellow-poplar, eastern white pine, black walnut, white oak, hickory, white ash, southern red oak.

See footnotes at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume	
SrF**:									
Sengtown	Severe	Severe	Slight	Slight	Moderate	Southern red oak	70	57	Yellow poplar, eastern white pine, black walnut, white oak, hickory, white ash, southern red oak.
						Yellow-poplar	90	86	
						Shortleaf pine	70	114	
Rock outcrop.									
StC**:									
Sengtown	Slight	Slight	Slight	Slight	Moderate	Southern red oak	70	4	Yellow-poplar, white oak, hickory, white ash, southern red oak.
						Yellow-poplar	90	6	
						Shortleaf pine	70	8	
Urban land.									
Su	Slight	Slight	Moderate	Slight	Severe	Yellow-poplar	100	114	Yellow-poplar, green ash, American sycamore, black walnut, sweetgum, cherrybark oak.
Sullivan						Northern red oak	70	57	
						Shortleaf pine	70	114	
						Virginia pine	70	114	
TrB, TrC2	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine	65	100	Eastern white pine, black walnut, loblolly pine, white oak, southern red oak.
Tarklin						White oak	74	57	
						Yellow-poplar	---	---	
						Black oak	---	---	
						Yellow poplar	---	---	
						Eastern redcedar	---	---	
WfA	Slight	Slight	Moderate	Slight	Moderate	Yellow-poplar	90	86	Yellow-poplar, black walnut, sweetgum, swamp white oak, cherrybark oak, American sycamore, green ash.
Wolftever						White oak	70	57	
						Southern red oak	70	57	
						Willow oak	80	72	
						Sweetgum	80	86	
						Loblolly pine	80	114	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
ArA Armour	Severe: flooding.	Slight	Moderate: flooding.	Severe: erodes easily.	Moderate: flooding.
ArB Armour	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
ArC Armour	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Be Beason	Severe: flooding, wetness.	Moderate: percs slowly, wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding, wetness.
ByB2 Byler	Moderate: wetness.	Moderate: percs slowly, wetness.	Moderate: slope, wetness.	Severe: erodes easily.	Slight.
ByC2 Byler	Moderate: slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
DkB Dickson	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, slope, wetness.	Severe: erodes easily.	Slight.
Gu Guthrie	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
HaD Hawthorne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
HgC: Hawthorne	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: large stones, slope, small stones.
Sugargrove	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: large stones, slope, small stones.
HsF: Hawthorne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Sulphura	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HuA---------- Humphreys	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight---------	Moderate: flooding, small stones, droughty.
HuB---------- Humphreys	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight---------	Moderate: small stones, droughty.
HuC---------- Humphreys	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight---------	Moderate: small stones, droughty.
LaB---------- Lax	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: slope, small stones, wetness.	Severe: erodes easily.	Moderate: wetness.
LaC---------- Lax	Moderate: percs slowly, slope, wetness.	Moderate: percs slowly, slope, wetness.	Severe: slope.	Severe: erodes easily.	Moderate: slope, wetness.
Ld---------- Lindell	Severe: flooding.	Moderate: wetness.	Moderate: small stones, wetness.	Slight---------	Moderate: flooding.
Me---------- Melvin	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
MnC---------- Minvale	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight---------	Moderate: slope, small stones.
MnD---------- Minvale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
MtB---------- Mountview	Slight---------	Slight---------	Moderate: slope.	Severe: erodes easily.	Slight.
MtC2---------- Mountview	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
No---------- Nolin	Severe: flooding.	Slight---------	Slight---------	Severe: erodes easily.	Moderate: flooding.
Pq: Pits,quarry					
Rc: Rock Outcrop					
SaD---------- Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SaF---------- Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

Table 8.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Sec Sengtown	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
SeC2 Sengtown	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: slope, small stones.
SeD2 Sengtown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SeF Sengtown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
SrF Sengtown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock Outcrop					
StC: Sengtown	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight	Moderate: small stones.
Urban Land					
Su Sullivan	Severe: flooding.	Slight	Moderate: flooding, small stones.	Slight	Moderate: flooding.
TrB Tarklin	Moderate: small stones.	Moderate: small stones, wetness.	Severe: small stones.	Moderate: wetness.	Moderate: large stones, small stones, wetness.
TrC2 Tarklin	Moderate: slope, small stones.	Moderate: slope, small stones, wetness.	Severe: slope, small stones.	Moderate: wetness.	Moderate: large stones, small stones, wetness.
Ud: Udarents					
W: Water					
WfA Wolftever	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight	Moderate: flooding.

Table 9.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ArA, ArB---- Armour	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
ArC---- Armour	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
Be---- Beason	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Fair	Good	Fair.
ByB2, ByC2---- Byler	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
DkB---- Dickson	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Gu---- Guthrie	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good.
HaD---- Hawthorne	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
HgC*:											
Hawthorne----	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
Sugargrove----	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
HsF*:											
Hawthorne ----	Very poor.	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.
Sulphura----	Very poor.	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
HuA, HuB---- Humphreys	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HuC---- Humphreys	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LaB---- Lax	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LaC---- Lax	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ld---- Lindell	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Me---- Melvin	Very poor.	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good.
MnC---- Minvale	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 9.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
MnD Minvale	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MtB Mountview	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor.
MtC2 Mountview	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor.
No Nolin	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
Pq*. Pits, quarry											
Rc*. Rock outcrop											
SaD Saffell	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
SaF Saffell	Very poor.	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.
SeC, SeC2 Sengtown	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
SeD2 Sengtown	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.
SeF Sengtown	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.
SrF*: Sengtown	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.											
StC*: Sengtown	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.											
Su Sullivan	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TrB Tarklin	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
TrC2 Tarklin	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.
Ud. Udarents											
WfA Wolftever	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ArA Armour	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Moderate: flooding.
ArB Armour	Slight	Slight	Slight	Slight	Severe: low strength.	Slight.
ArC Armour	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Be Beason	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.	Moderate: wetness, flooding.
ByB2 Byler	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
ByC2 Byler	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: low strength, wetness.	Moderate: slope.
DkB Dickson	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
Gu Guthrie	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
HaD Hawthorne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HgC*: Hawthorne	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
Sugargrove	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
HsF*: Hawthorne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Sulphura	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
HuA Humphreys	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: small stones, droughty, flooding.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HuB---------- Humphreys	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: small stones, droughty.
HuC---------- Humphreys	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty.
LaB---------- Lax	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
LaC ---------- Lax	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
Ld---------- Lindell	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Me---------- Melvin	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
MnC---------- Minvale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: small stones, slope.
MnD---------- Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MtB---------- Mountview	Moderate: too clayey.	Slight---------	Moderate: shrink-swell.	Slight---------	Severe: low strength.	Slight.
MtC2---------- Mountview	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
No---------- Nolin	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Pq*. Pits, quarry						
Rc*. Rock outcrop						
SaD, SaF---------- Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SeC, SeC2--------- Sengtown	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
SeD2, SeF--------- Sengtown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SrF*:						
Sengtown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						
StC*:						
Sengtown	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: small stones.
Urban land.						
Su	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Sullivan						
TrB	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, large stones, wetness.
Tarklin						
TrC2	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope.	Moderate: small stones, large stones, wetness.
Tarklin						
Ud.						
Udarents						
WfA	Moderate: too clayey, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
Wolftever						

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ArA Armour	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: too clayey.
ArB Armour	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Fair: too clayey.
ArC Armour	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.
Be Beason	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, wetness.
ByB2 Byler	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Moderate: wetness.	Fair: too clayey, small stones.
ByC2 Byler	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: too clayey, small stones, slope.
DkB Dickson	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
Gu Guthrie	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
HaD Hawthorne	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
HgC*: Hawthorne	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Sugargrove	Moderate: depth to rock, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: small stones.
HsF*: Hawthorne	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HsF*: Sulphura	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
HuA Humphreys	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: small stones.
HuB Humphreys	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Poor: small stones.
HuC Humphreys	Moderate: wetness, slope.	Severe: seepage, slope.	Severe: seepage, wetness.	Severe: seepage.	Poor: small stones.
LaB Lax	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: seepage.	Poor: too clayey, hard to pack, small stones.
LaC Lax	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Severe: seepage, wetness, too clayey.	Severe: seepage.	Poor: too clayey, hard to pack, small stones.
Ld Lindell	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, small stones, wetness.
Me Melvin	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
MnC Minvale	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones.
MnD Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MtB Mountview	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack, small stones.
MtC2 Mountview	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
No Nolin	Severe: flooding, wetness.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Pq*. Pits, quarry					
Rc*. Rock outcrop					
SaD, SaF---------- Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
SeC, SeC2 --------- Sengtown	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
SeD2, SeF---------- Sengtown	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
SrF*: Sengtown---------- Rock outcrop.	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
StC*: Sengtown---------- Urban land.	Moderate: percs slowly.	Severe: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack, small stones.
Su---------- Sullivan	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
TrB---------- Tarklin	Severe: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Poor: small stones.
TrC2---------- Tarklin	Severe: wetness, percs slowly.	Severe: seepage, slope.	Severe: seepage, wetness.	Moderate: wetness, slope.	Poor: small stones.
Ud. Udarents					
WfA ---------- Wolftever	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ArA, ArB Armour	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
ArC Armour	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Be Beason	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ByB2, ByC2 Byler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
DkB Dickson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Gu Guthrie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
HaD Hawthorne	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
HgC*: Hawthorne	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Sugargrove	Fair: depth to rock, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
HsF*: Hawthorne	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Sulphura	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
HuA, HuB, HuC Humphreys	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LaB, LaC Lax	Fair: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

Table 12 Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ld---------- Lindell	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Me---------- Melvin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MnC---------- Minvale	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MnD---------- Minvale	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MtB, MtC2---------- Mountview	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
No---------- Nolin	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
Pq*. Pits, quarry				
Rc*. Rock outcrop				
SaD---------- Saffell	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SaF---------- Saffell	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SeC, SeC2, SeD2---------- Sengtown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
SeF---------- Sengtown	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
SrF*: Sengtown----------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Rock outcrop.				

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
StC*:				
Sengtown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Urban land.				
Su	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Sullivan				
TrB, TrC2	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Tarklin				
Ud.				
Udarents				
WfA	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Wolftever				

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "sl
"moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information i
indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
ArA---- Armour	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Erodes easily, flooding.	Erodes easily
ArB---- Armour	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily
ArC---- Armour	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily
Be---- Beason	Slight----	Severe: wetness.	Severe: slow refill.	Flooding----	Wetness, erodes easily, flooding.	Erodes easily wetness.
ByB2---- Byler	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily wetness.
ByC2---- Byler	Severe: slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, erodes easily wetness.
DkB---- Dickson	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily wetness.
Gu---- Guthrie	Slight----	Severe: piping, ponding.	Severe: no water.	Ponding, percs slowly.	Ponding, percs slowly, rooting depth.	Erodes easily ponding, rooting depth
HaD---- Hawthorne	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to roc
HgC*: Hawthorne----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to roc

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
HgC*:						
Sugargrove	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, large stones
HsF*:						
Hawthorne	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to roc
Sulphura	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones depth to roc
HuA	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Droughty, flooding.	Favorable
HuB Humphreys	Severe: seepage.	Moderate: piping.	Severe: no water.	Deep to water	Slope, droughty.	Favorable
HuC Humphreys	Severe: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope
LaB Lax	Severe: seepage.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily wetness.
LaC Lax	Severe: seepage, slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, slope.	Slope, wetness, percs slowly.	Slope, erodes easil wetness.
Ld Lindell	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Flooding	Wetness, flooding.	Wetness
Me Melvin	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Wetness, erodes easily, flooding.	Erodes easily wetness.
MnC, MnD Minvale	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope

See footnote at end of table.

Table 13.--Water Management Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
MtB---------- Mountview	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily
MtC2---------- Mountview	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily
No---- Nolin	Severe: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Erodes easily, flooding.	Erodes easily
Pq*. Pits, quarry						
Rc*. Rock outcrop						
SaD, SaF Saffell	Severe: seepage, slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, soil blowing.
SeC, SeC2, SeD2, SeF---------- Sengtown	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope----------
SrF*: Sengtown---------	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope----------	Slope-------
Rock outcrop.						
StC*: Sengtown---------	Moderate: seepage, slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope----------	Favorable-----
Urban land.						
Su---------- Sullivan	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Flooding-------	Favorable-----

See footnote at end of table.

Table 13. Water Management Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions
TrB---------- Tarklin	Severe: seepage.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Wetness, rooting depth
TrC2---------- Tarklin	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, wetness, rooting depth
Ud. Udarents						
WfA Wolftever	Slight---------	Severe: hard to pack.	Severe: slow refill.	Flooding	Wetness, erodes easily.	Erodes easily wetness.

Table 14.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
ArA, ArB - ----- Armour	0-8	Silt loam--------	CL-ML, CL, ML	A-4	0	95-100	90-100	85-100	80-95	25-35	5-10
	8-46	Silt loam, silty clay loam.	CL	A-4, A-6	0	95-100	90-100	85-100	85-100	28-40	8-18
	46-60	Gravelly silt loam, gravelly sandy loam, very gravelly silty clay loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6	0 5	50-80	50-80	40-70	20-65	<30	NP-12
ArC---------- Armour	0 7	Silt loam--------	CL-ML, CL, ML	A-4	0	90-100	80-100	75-95	70-90	25-35	5-10
	7-36	Silty clay loam, silt loam.	CL	A 4, A-6	0	90-100	80-100	75-95	70-95	30-40	8-18
	36-60	Silty clay loam, silty clay, clay.	ML, MH, GM, GC	A-4, A-6, A-7	0-3	60-100	50-95	45-90	40-85	35-53	9-23
Be---------- Beason	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	75-90	25-40	5-15
	7-19	Silty clay loam, silt loam.	CL	A-6	0	100	95-100	90-100	80 95	25-40	11-20
	19-52	Silty clay loam, silty clay, clay.	CL	A-6, A-7	0	100	95-100	90-95	80-95	30-49	11-25
	52-60	Variable---------	---	---	---	---	---	---	---	---	---
ByB2, ByC2------- Byler	0-8	Silt loam--------	CL-ML, CL, ML	A-4	0	100	95-100	85-95	75-90	20-30	3-10
	8-21	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6	0	100	95-100	85-100	85-95	20-40	3-15
	21-44	Silty clay loam, silt loam, gravelly silty clay loam.	CL, ML	A-6, A-4, A-7	0-5	80-100	75-100	70-100	60-95	30-45	8-20
	44-60	Clay, silty clay, gravelly clay.	MH, ML	A-7	0-10	65-100	60-100	55-95	50 90	40-60	12-25
DkB---------- Dickson	0-8	Silt loam--------	CL-ML, ML	A-4	0	100	95-100	90-100	75-95	20-28	2-7
	8-23	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	95-100	85-95	25-38	5-17
	23-50	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	80-95	25-42	7-20
	50-60	Clay, cherty silty clay loam, cherty clay.	MH, ML, GC, CL	A-6, A-7	0-20	70-100	60-100	55-100	45-95	35-65	12-30
Gu---------- Guthrie	0-14	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	85-95	18-28	2-7
	14 28	Silt loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	85-95	23-39	5-15
	28-46	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	90-100	85-100	80-100	70-95	20-42	5-20
	46-60	Silty clay loam, silt loam.	CL, CL ML	A-6, A-7, A-4	0-5	85-100	80-100	75-100	66-95	20-50	4-25

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
HaD---------- Hawthorne	0-14	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	14-26	Very channery silty clay loam, very channery silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6	0-15	55-75	45-70	40-65	30-60	20-35	3-12
	26-60	Weathered bedrock	--	---	---	---	---	---	---	---	---
HgC*: Hawthorne-------	0-14	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	14-26	Very channery silty clay loam, very channery silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6	0 15	55 75	45 70	40-65	30-60	20-35	3 12
	26-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Sugargrove------	0-15	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-10	65-85	55-80	45-75	40-75	25-35	4-10
	15-45	Gravelly silt loam, gravelly silty clay loam, channery silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-15	65-85	55-80	45-75	40-70	25-40	6-20
	45-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
HsF*: Hawthorne-------	0-14	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	14-26	Very channery silty clay loam, very channery silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6	0-15	55-75	45-70	40-65	30-60	20-35	3-12
	26-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Sulphura--------	0-12	Gravelly silt loam.	ML, CL-ML, CL	A-4	0-8	70-90	65-85	60-80	55-75	20-32	2-10
	12-22	Very channery silt loam, very channery silty clay loam, channery loam.	GC, GM-GC	A-2, A-4, A-6	5-20	45-60	40-55	35-50	30-45	23-32	6-12
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
HuA, HuB, HuC---- Humphreys	0-13	Gravelly silt loam.	ML, CL-ML, CL, GM-GC	A-4	0-5	60-75	55-75	50-70	35-55	18-28	3-10
	13-46	Gravelly silty clay loam, gravelly clay loam, gravelly silt loam.	CL, GC, SC	A-6	0-5	55-75	50-75	45-70	40-60	28-40	10-16
	46-60	Gravelly silty clay loam, gravelly clay loam, very gravelly clay loam.	CL, GC, SC	A-4, A-6, A-2	0-10	45-75	40-75	30-65	20-55	25-35	8-15

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
LaB, LaC--------- Lax	0-10	Silt loam--------	ML, CL-ML, CL	A 4	0	80-100	75-100	70-95	55-85	15-30	3-10
	10-24	Silt loam, silty clay loam.	CL	A-4, A-6	0	80-100	75-100	70-95	60-95	25-40	8-16
	24-36	Gravelly silty clay loam, very gravelly silt loam, extremely gravelly silty clay loam.	GC	A-2	0-20	30-50	25-50	20-45	15-30	25-40	8-18
	36-60	Very gravelly silty clay, very gravelly clay, extremely gravelly silty clay.	CL, CH, GC, SC	A-2, A-6, A-7	0-20	30-75	25-75	20-70	15-60	35-55	15-30
Ld--------------- Lindell	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	90-100	75-100	65-90	55-80	18-30	3-10
	6-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0-2	90-100	75-95	65-90	55-80	23-39	6-18
Me--------------- Melvin	0-10	Silt loam--------	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	80-95	25-35	4-10
	10-39	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	80-98	25-40	5-20
	39-60	Silt loam, silty clay loam, loam.	CL, CL-ML	A-4, A-6	0	85-100	80-100	70-100	60-98	25 40	5-20
MnC, MnD--------- Minvale	0-6	Gravelly silt loam.	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
	6-39	Gravelly silty clay loam, gravelly silt loam, gravelly loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	50-75	50-75	40 70	36-65	20-40	5-15
	39-60	Gravelly silty clay loam, gravelly silty clay.	CL, ML, GC, SC	A-4, A-6, A-7	0-5	55-80	50-75	40-70	36-65	25-50	7-23
MtB-- Mountview	0-9	Silt loam--------	ML, CL-ML	A-4	0	100	95-100	95-100	80-96	20-30	2-7
	9-22	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	80 96	30-43	10-23
	22-60	Clay, cherty clay, cherty silty clay loam.	CL, ML, MH, CH	A-6, A-7	0-20	75-100	65-100	60-98	50-96	35-65	11-32
MtC2--------- Mountview	0-6	Silt loam --------	ML, CL-ML	A-4	0	100	95-100	95-100	80-96	20-30	2 7
	6-22	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	80-96	30-43	10-23
	22-60	Clay, cherty clay, cherty silty clay loam.	CL, ML, MH, CH	A-6, A-7	0-20	75-100	65-100	60-98	50-96	35-65	11-32
No--------- Nolin	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	25-40	5-18
	5-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	100	95-100	85 100	75-100	25-46	5-23

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
Pq*. Pits, quarry											
Rc*. Rock outcrop											
SaD, SaF--- Saffell	0-10	Gravelly fine sandy loam.	SM, SC-SM, GM, GM-GC	A-1, A-2, A-4	0-5	50-80	50-75	40-70	20-50	<25	NP-5
	10-36	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, GP-GC, GM-GC	A-2, A-1, A-4, A-6	0-10	25-55	25-50	20-50	12-40	20-40	4-15
	36-60	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-15	15-80	10-75	10-65	5-35	<35	NP-15
SeC, SeC2--- Sengtown	0-9	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45-75	45-70	25-35	4-10
	9-15	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	15-60	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
SeD2--- Sengtown	0-5	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45-75	45-70	25 35	4-10
	5-15	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	15-60	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
SeF--- Sengtown	0-9	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45-75	45-70	25-35	4-10
	9-15	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	15-60	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
SrF*: Sengtown---	0-9	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45-75	45-70	25-35	4-10
	9-15	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	15-60	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
Rock outcrop.											

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
StC*:											
Sengtown	0-9	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45-75	45-70	25-35	4-10
	9-15	Gravelly silt loam, gravelly silty clay loam.	CL ML, CL, GM GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	15-60	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
Urban land.											
Su	0-45	Silt loam	ML, CL, CL-ML, SM	A-4	0	80-100	75-100	60-100	36-90	20-31	3-10
Sullivan	45-60	Gravelly fine sandy loam, gravelly loam, silt loam.	SM, SC-SM, SC, GM	A-4, A-2	0-5	65-100	55-100	45-85	25-55	20-30	3-10
TrB, TrC2	0-6	Gravelly silt loam.	ML, CL, GM, SM	A-4	0-10	60-80	55-75	45-75	40-70	25-35	2-10
Tarklin	6-20	Gravelly silt loam, gravelly silty clay loam.	ML, CL, GM, GC	A-4, A-6, A-7-6	0-10	60-80	55-75	45-75	40-70	25-45	2-20
	20-38	Gravelly silt loam, gravelly silty clay loam.	ML, CL, GM, GC	A-4, A-6, A-7-6, A-2	0-10	60-80	45-75	40-75	30-70	25-45	2-20
	38-60	Gravelly silt loam, very gravelly silty clay loam.	GM, GC	A-2-5, A-2-6	0-15	40-60	30-50	25-45	20-40	25-45	2-20
Ud.											
Udarents											
WfA	0-7	Silt loam	CL-ML, CL, ML	A-4, A-6	0	100	95-100	90-100	80-95	25-35	3-12
Wolftever	7-13	Silty clay, silty clay loam, silt loam.	ML, CL	A-4, A-6	0	100	95-100	90-100	80-95	30-40	7-15
	13 52	Silty clay, silty clay loam, clay.	ML, MH	A-7	0	100	95-100	90-100	75-95	41-55	11-20
	52-60	Loam, clay loam, silty clay loam.	CL-ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	51-90	25-45	5-20

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
ArA, ArB	0-8	10-27	1.30-1.45	0.6-2.0	0.18-0.22	5.1-6.0	Low	0.43	5	1-3
Armour	8-46	22-35	1.30-1.50	0.6-2.0	0.16-0.20	5.1-6.0	Low	0.37		
	46-60	12-27	1.35-1.55	2.0-6.0	0.08-0.14	5.1-6.0	Low	0.28		
ArC	0-7	15-27	1.30-1.45	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.43	5	1-3
Armour	7-36	22-35	1.30-1.50	0.6-2.0	0.17 0.20	5.1-6.0	Low	0.37		
	36-60	30-50	1.35-1.55	0.6 2.0	0.10-0.18	5.1-6.0	Moderate	0.37		
Be	0-7	22-35	1.35-1.55	0.6-2.0	0.17-0.20	4.5-6.0	Low	0.37	5	1-3
Beason	7-19	26-40	1.40-1.60	0.6-2.0	0.17-0.20	4.5-5.5	Low	0.32		
	19-52	35-45	1.45-1.65	0.2-0.6	0.14-0.18	4.5-5.5	Low	0.32		
	52-60	---	---	0.06-0.6	---	---		----		
ByB2, ByC2	0-8	15-27	1.35-1.50	0.6-2.0	0.18-0.22	5.1-6.0	Low	0.43	3	1-3
Byler	8-21	20-35	1.35-1.50	0.6-2.0	0.17-0.20	5.1-6.0	Low	0.37		
	21-44	22-38	1.50-1.70	0.06-0.2	0.04-0.08	5.1-6.0	Low	0.32		
	44-60	40-55	1.30-1.50	0.2-0.6	0.04-0.08	5.1-6.0	Moderate	0.24		
DkB	0-8	15-26	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low	0.43	3	.5-2
Dickson	8-23	18-30	1.35-1.55	0.6-2.0	0.18-0.20	4.5-5.5	Low	0.43		
	23-50	20-32	1.55-1.75	0.06-0.2	0.05-0.11	4.5-5.5	Low	0.43		
	50-60	35-50	1.35-1.55	0.2-0.6	0.02-0.04	4.5-5.5	Moderate	0.28		
Gu	0-14	10-25	1.35-1.55	0.6-2.0	0.20-0.22	3.6-5.5	Low	0.43	3	1-2
Guthrie	14-28	18-30	1.40-1.60	0.6-2.0	0.18-0.20	3.6-5.5	Low	0.43		
	28-46	18-32	1.60-1.75	0.06-0.2	0.03-0.05	3.6-5.5	Low	0.43		
	46-60	18-35	1.60-1.75	0.06-0.2	0.03-0.05	3.6-5.5	Low	0.43		
HaD	0-14	12-25	1.40-1.50	2.0 6.0	0.14 0.18	3.6-5.5	Low	0.20	2	1-3
Hawthorne	14-26	15-32	1.40-1.50	2.0 6.0	0.05-0.10	3.6-5.5	Low	0.10		
	26-60	---	---	0.0-0.2	---	---		----		
HgC*:										
Hawthorne	0-14	12-25	1.40-1.50	2.0-6.0	0.14-0.18	3.6-5.5	Low	0.20	2	1-3
	14-26	15-32	1.40-1.50	2.0-6.0	0.05-0.10	3.6-5.5	Low	0.10		
	26-60	--	---	0.0-0.2	---	---		----		
Sugargrove	0-15	10-27	1.20-1.40	0.6-6.0	0.14-0.19	4.5-5.5	Low	0.28	3	1-3
	15-45	18-35	1.30-1.50	0.6-6.0	0.14-0.19	4.5-5.5	Low	0.28		
	45-60	---	---	0.00-0.2	---	---		----		
HsF*:										
Hawthorne	0-14	12-25	1.40-1.50	2.0-6.0	0.14-0.18	3.6-5.5	Low	0.20	2	1-3
	14-26	15-32	1.40-1.50	2.0-6.0	0.05-0.10	3.6-5.5	Low	0.10		
	26-60	---	---	0.0-0.2	---	---		----		
Sulphura	0-12	15-25	1.30-1.50	2.0-6.0	0.12-0.17	5.1-6.0	Low	0.24	2	.5-2
	12-22	18-32	1.35-1.55	2.0-6.0	0.07-0.14	5.1-6.5	Low	0.24		
	22	---	---	0.00-0.06	---	---		----		
HuA, HuB, HuC	0-13	12-25	1.35-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.28	5	2-4
Humphreys	13-46	18-32	1.35-1.55	2.0-6.0	0.09-0.14	4.5-6.0	Low	0.24		
	46-60	18-32	1.40-1.60	2.0-6.0	0.06-0.12	4.5-6.0	Low	0.24		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
LaB, LaC---------	0-10	8-25	1.30-1.45	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.43	3	.5-2
Lax	10-24	18-35	1.30-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.43		
	24-36	18-35	1.50-1.75	0.06-0.2	0.06-0.10	4.5-5.5	Low----------	0.37		
	36-60	30-45	1.40-1.60	0.6-6.0	0.06-0.10	4.5-5.5	Moderate-----	0.32		
Ld---------------	0-6	12-27	1.35-1.50	0.6-2.0	0.16-0.20	5.6-7.3	Low----------	0.32	5	1-3
Lindell	6-60	20-35	1.35-1.50	0.6-2.0	0.14-0.17	5.6-7.3	Low----------	0.28		
Me---------------	0-10	12-17	1.20-1.60	0.6-2.0	0.18 0.23	5.6-7.8	Low----------	0.43	5	.5-3
Melvin	10-39	12-35	1.30-1.60	0.6-2.0	0.18-0.23	5.6-7.8	Low----------	0.43		
	39-60	7-40	1.40-1.70	0.6-2.0	0.16-0.23	5.6-7.8	Low ---------	0.43		
MnC, MnD---------	0-6	15-27	1.30-1.45	2.0-6.0	0.14-0.18	4.5-5.5	Low----------	0.28	5	.5 2
Minvale	6-39	20-35	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28		
	39-60	25-45	1.40-1.55	0.6-2.0	0.11-0.17	4.5-5.5	Low----------	0.28		
MtB---------------	0-9	15-27	1.35-1.55	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	5	1-3
Mountview	9-22	20-35	1.40-1.60	0.6-2.0	0.17-0.20	4.5-5.5	Low----------	0.43		
	22-60	35-55	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Moderate- - -	0.32		
MtC2--------------	0-6	15-25	1.35-1.55	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	5	1-3
Mountview	6-22	20-35	1.40-1.60	0.6-2.0	0.17 0.20	4.5-5.5	Low----------	0.43		
	22-60	35-55	1.30-1.50	0.6-2.0	0.10 0.15	4.5-5.5	Moderate-----	0.32		
Nc-- ------------	0-5	12-27	1.20-1.40	0.6-2.0	0.18-0.23	5.6-8.4	Low---- --	0.43	5	2-4
Nolin	5-60	12-35	1.25-1.50	0.6-2.0	0.18-0.23	5.6-8.4	Low----------	0.43		
Pq*.										
Pits, quarry										
Rc*.										
Rock outcrop										
SaD, SaF---------	0-10	5-20	1.35-1.60	2.0-6.0	0.07-0.17	4.5-5.5	Low- --------	0.20	4	1-2
Saffell	10-36	12-35	1.35-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	36-60	10-25	1.40-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
SeC, SeC2--------	0-9	12-27	1.35-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.28	5	1-2
Sengtown	9-15	23-40	1.35-1.55	0.6-2.0	0.10 0.15	4.5-6.0	Low----------	0.24		
	15-60	40-60	1.35-1.60	0.6-2.0	0.08-0.12	4.5-6.0	Moderate-----	0.24		
SeD2--------------	0-5	12-27	1.35-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.28	5	1-2
Sengtown	5-15	23-40	1.35-1.55	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24		
	15-60	40-60	1.35-1.60	0.6-2.0	0.08-0.12	4.5-6.0	Moderate-----	0.24		
SeF---------------	0-9	12-27	1.35-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.28	5	1-2
Sengtown	9-15	23-40	1.35-1.55	0.6-2.0	0.10-0.15	4.5-6.0	Low---------	0.24		
	15-60	40-60	1.35-1.60	0.6-2.0	0.08-0.12	4.5-6.0	Moderate-----	0.24		
SrF*:										
Sengtown---------	0-9	12-27	1.35-1.55	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.28	5	1-2
	9-15	23-40	1.35-1.55	0.6 2.0	0.10-0.15	4.5-6.0	Low----------	0.24		
	15-60	40-60	1.35-1.60	0.6-2.0	0.08-0.12	4.5-6.0	Moderate-----	0.24		
Rock outcrop.										
StC*:										
Sengtown---------	0-9	12-27	1.35 1.55	0.6-2.0	0.10-0.16	4.5-6.0	Low----------	0.28	5	1-2
	9-15	23-40	1.35-1.55	0.6-2.0	0.10-0.15	4.5-6.0	Low----------	0.24		
	15-60	40-60	1.35-1.60	0.6-2.0	0.08 0.12	4.5-6.0	Moderate-----	0.24		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
StC*:										
Urban land.										
Su	0-45	18-25	1.30-1.45	0.6-2.0	0.12-0.20	5.1-7.3	Low	0.32	5	1-3
Sullivan	45-60	15-25	1.30-1.45	0.6-2.0	0.09-0.14	5.1-7.3	Low	0.32		
TrB, TrC2	0-6	18-25	1.25-1.45	0.6-6.0	0.13-0.18	3.6-5.5	Low	0.28	3	.5-2
Tarklin	6-20	20-34	1.45-1.55	0.6-6.0	0.13-0.18	3.6-5.5	Low	0.28		
	20-38	20-34	1.45-1.60	0.06-0.2	0.06-0.10	3.6-5.5	Low	0.28		
	38-60	20-34	1.45-1.55	0.6-0.2	0.04-0.08	3.6-5.5	Low	0.20		
Ud.										
Udarents										
WfA	0-7	22-40	1.35-1.45	0.6-2.0	0.17-0.20	4.5-5.5	Low	0.37	5	1-3
Wolftever	7-13	22-45	1.35-1.50	0.2-0.6	0.15-0.18	4.5-5.5	Low	0.32		
	13-52	35-55	1.40-1.60	0.2-0.6	0.13-0.17	4.5-5.5	Moderate	0.32		
	52-60	20-40	1.40-1.60	0.2-0.6	0.13-0.17	4.5-5.5	Low	0.32		

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Soil and Water Features

("Flooding" and "water table" and terms such as "apparent" and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
ArA---------- Armour	B	Occasional	Very brief	Dec-Apr	>6.0	---	---	>60	---	Moderate	Moderate.
ArB, ArC---------- Armour	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Be---------- Beason	C	Occasional	Very brief	Dec-Apr	1.0-2.0	Apparent	Dec-Apr	>60	---	High-----	High.
ByB2, ByC2-------- Byler	C	None--- ---	---	---	1.5-3.0	Perched	Dec-Mar	>60	---	High-----	Moderate.
DkB---------- Dickson	C	None--------	---	---	1.5-3.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
Gu---------- Guthrie	D	None--------	---	---	+2-1.0	Perched	Dec-May	>60	---	High-----	High.
HaD---------- Hawthorne	B	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	High.
HgC*:											
Hawthorne--------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	High.
Sugargrove-------	B	None--------	--	---	>6.0	---	---	40-60	Soft	Moderate	Moderate.
HsF*:											
Hawthorne--------	B	None--------	---	---	>6.0	-	---	20-40	Soft	Low------	High.
Sulphura---------	B	None--------	---	---	>6.0	---	---	20-40	Hard	Low------	Moderate.
HuA---------- Humphreys	B	Occasional	Very brief	Dec-Mar	5.0-6.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
HuB, HuC---------- Humphreys	B	None--------	---	---	5.0-6.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
LaB, LaC---------- Lax	C	None----- -	---	---	1.5-2.5	Perched	Dec-Mar	>60	---	High-----	Moderate.
Ld---------- Lindell	C	Occasional	Very brief	Dec-Mar	2.0-3.0	Apparent	Dec Mar	>60	---	Moderate	Low.
Me---------- Melvin	D	Frequent----	Long	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High-----	Low.
MnC, MnD---------- Minvale	B	None--------	---		>6.0	---	---	>60	---	Moderate	Low.
MtB, MtC2--------- Mountview	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
No Nolin	B	Occasional	Brief	Feb-May	3.0 6.0	Apparent	Feb-Mar	>60	---	Low	Moderate.
Pq*. Pits, quarry											
Rc*. Rock outcrop											
SaD, SaF Saffell	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
SeC, SeC2, SeD2, SeF Sengtown	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
SrF*: Sengtown	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
Rock outcrop.											
StC*: Sengtown	B	None	---	---	>6.0		---	>60	---	High	Moderate.
Urban land.											
Su Sullivan	B	Occasional	Brief	Dec-Mar	4.0-6.0	Apparent	Dec-Mar	>60	---	Low	Low.
TrB, TrC2 Tarklin	C	None	---	---	1.5-2.0	Perched	Jan-Apr	>60		Moderate	High.
Ud. Udarents											
WfA Wolftever	C	Occasional	Very brief	Dec-Apr	2.5-3.5	Apparent	Dec-Mar	>60	---	High	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Classification of the Soils

Soil name	Family or higher taxonomic class
Armour	Fine-silty, mixed, thermic Ultic Hapludalfs
Beason	Clayey, mixed, thermic Aquic Hapludults
Byler	Fine-silty, siliceous, thermic Typic Fragiudalfs
Dickson	Fine-silty, siliceous, thermic Glossic Fragiudults
Guthrie	Fine-silty, siliceous, thermic Typic Fragiaquults
Hawthorne	Loamy-skeletal, siliceous, thermic Ruptic-Ultic Dystrochrepts
Humphreys	Fine-loamy, siliceous, thermic Humic Hapludults
Lax	Fine-silty, siliceous, thermic Typic Fragiudults
Lindell	Fine-loamy, mixed, thermic Fluvaquentic Eutrochrepts
Melvin	Fine silty, mixed, nonacid, mesic Typic Fluvaquents
Minvale	Fine-loamy, siliceous, thermic Typic Paleudults
Mountview	Fine-silty, siliceous, thermic Typic Paleudults
Nolin	Fine-silty, mixed, mesic Dystric Fluventic Eutrochrepts
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Sengtown	Fine, mixed, thermic Typic Paleudalfs
Sugargrove	Fine-loamy, mixed, thermic Typic Hapludults
Sullivan	Fine-loamy, siliceous, thermic Dystric Fluventic Eutrochrepts
Sulphura	Loamy-skeletal, siliceous, thermic Ruptic-Alfic Dystrochrepts
Tarklin	Fine-loamy, siliceous, mesic Typic Fragiudults
Wolftever	Clayey, mixed, thermic Aquic Hapludults

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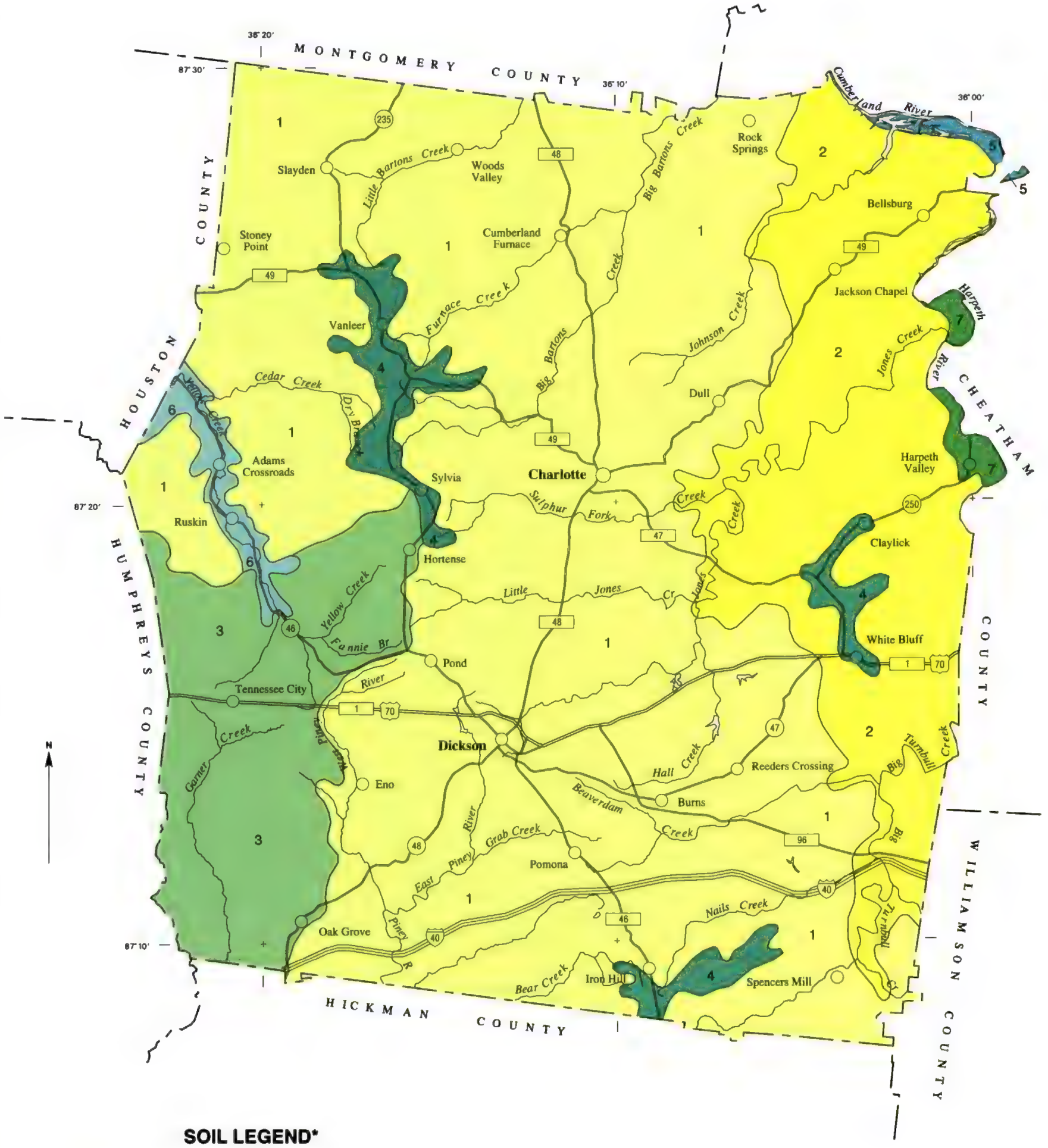


SOIL LEGEND*

1	SENGTOWN
2	HAWTHORNE-SENGTOWN-SULPHURA
3	SAFFELL-LAX
4	SENGTOWN-MOUNTVIEW-DICKSON
5	WOLFTEVER-BEASON-MELVIN
6	ARMOUR-HUMPHREYS-SULLIVAN
7	BYLER-NOLIN

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1991

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TENNESSEE AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

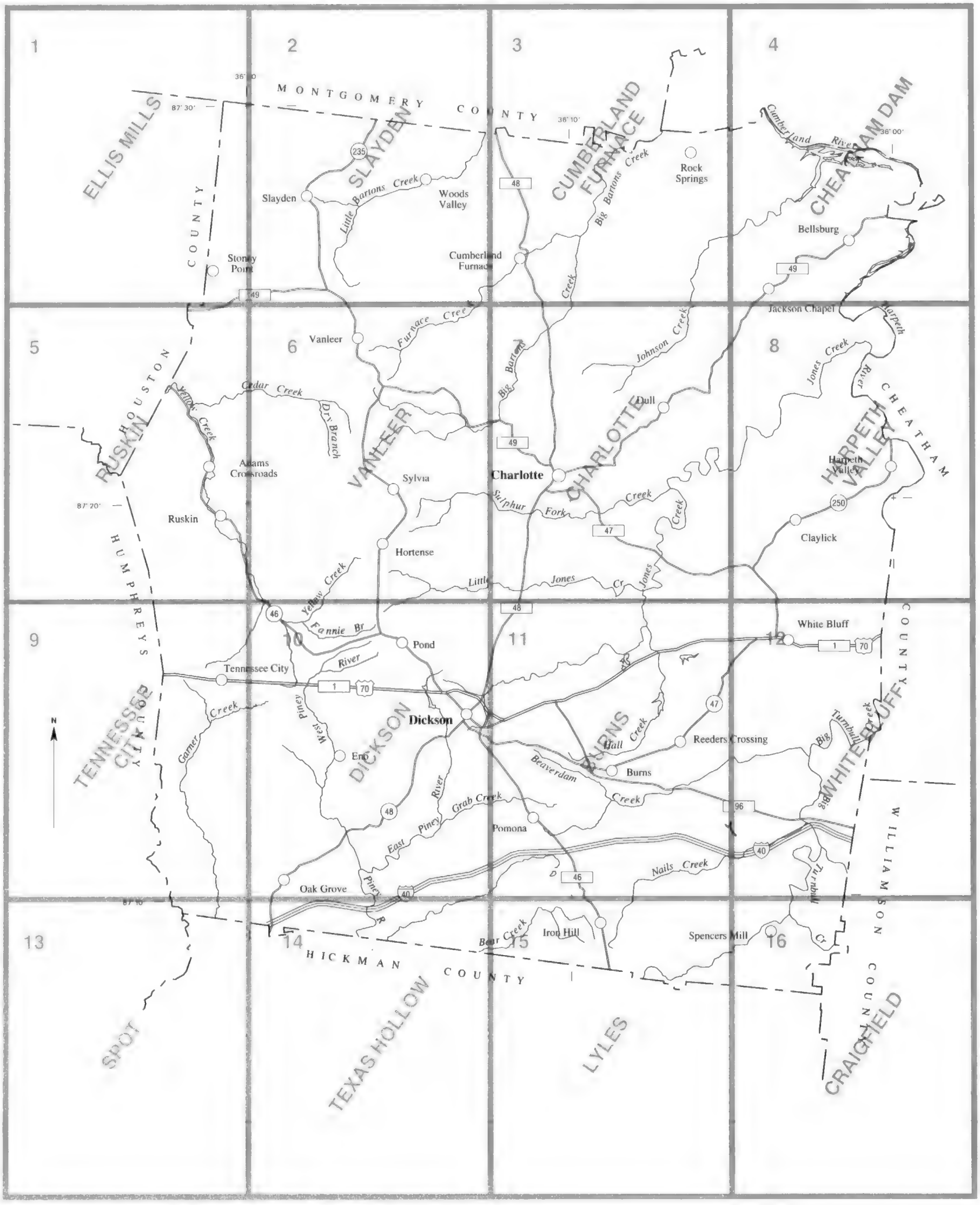
DICKSON COUNTY, TENNESSEE

Scale 1:190080

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

DICKSON COUNTY, TENNESSEE

Scale 1:190080

1 0 1 2 3

MILES

1 0 1 2 3 4 5 6

KILOMETERS

SOIL LEGEND

Map symbols consist of a combination of letters and numbers. The first two letters are listed alphabetically and represent the kind of soil. The first letter is a capital letter and the second letter is a small letter. A capital letter following the small letter indicates the slope class. Symbols without a slope letter are for nearly level soils or miscellaneous areas. A final number of 2 following the slope letter indicates that the slope is moderately eroded and 3 that it is severely eroded.

SYMBOL	NAME
ArA	Armour silt loam, 0 to 2 percent slopes, gravelly substratum, occasionally flooded
ArB	Armour silt loam, 2 to 5 percent slopes, gravelly substratum
ArC	Armour silt loam, 5 to 12 percent slopes
Be	Beason silt loam, occasionally flooded
ByB2	Byler silt loam, 2 to 5 percent slopes, eroded
ByC2	Byler silt loam, 5 to 12 percent slopes, eroded
DkB	Dickson silt loam, 2 to 5 percent slopes
Gu	Guthrie silt loam, ponded
HaD	Hawthorne gravelly silt loam, 12 to 20 percent slopes
HgC	Hawthorne-Sugargrove complex, 5 to 12 percent slopes
HsF	Hawthorne-Sulphura association, steep
HuA	Humphreys gravelly silt loam, 0 to 2 percent slopes, occasionally flooded
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes
HuC	Humphreys gravelly silt loam, 5 to 12 percent slopes
LaB	Lax silt loam, 2 to 5 percent slopes
LaC	Lax silt loam, 5 to 12 percent slopes
Ld	Lindell silt loam, occasionally flooded
Me	Melvin silt loam, frequently flooded
MnC	Minvale gravelly silt loam, 5 to 12 percent slopes
MnD	Minvale gravelly silt loam, 12 to 20 percent slopes
MtB	Mountview silt loam, 2 to 5 percent slopes
MtC2	Mountview silt loam, 5 to 12 percent slopes, eroded
No	Nolin silt loam, occasionally flooded
Pq	Pits, quarry
Rc	Rock outcrop, very steep
SaD	Saffell gravelly fine sandy loam, 12 to 20 percent slopes
SaF	Saffell gravelly fine sandy loam, 20 to 60 percent slopes
SeC	Sengtown gravelly silt loam, 5 to 12 percent slopes
SeC2	Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded
SeD2	Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded
SeF	Sengtown gravelly silt loam, 20 to 60 percent slopes
SrF	Sengtown-Rock outcrop complex, 20 to 60 percent slopes
StC	Sengtown-Urban land complex, 2 to 12 percent slopes
Su	Sullivan silt loam, occasionally flooded
TrB	Tarklin gravelly silt loam, 2 to 5 percent slopes
TrC2	Tarklin gravelly silt loam, 5 to 12 percent slopes, eroded
Ud	Udarents, clayey
WfA	Wolftever silt loam, occasionally flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- County or parish
- Reservation (national forest or park, state forest or park, and large airport)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

ROAD EMBLEM & DESIGNATIONS

- Interstate (173)
- Federal (287)
- State (92)

DAMS

Medium or Small (Named where applicable)

PITS

- Borrow pit, < 3 acres
- Quarry

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end

LAKES, PONDS AND RESERVOIRS

- Perennial

MISCELLANEOUS WATER FEATURES

- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS (Be, Su)
- SHORT STEEP SLOPE
- DEPRESSION OR SINK
- SOIL SAMPLE (typical pedon) (S)

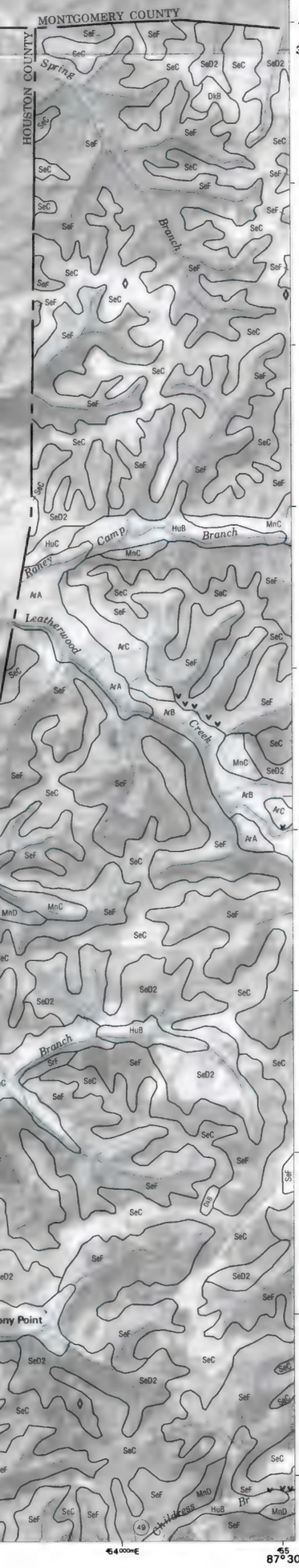
MISCELLANEOUS

- Gravelly spot
- Rock outcrop (includes sandstone and shale)
- Sandy spot
- Severely eroded spot

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
ELLIS MILLS QUADRANGLE
SHEET NUMBER 1 OF16

87°37'30" 87°35'00" 87°32'30" 87°30'00"
36°22'30" 36°20'00" 36°17'30" 36°15'00"
444000mE 445 446 447 448 449 450 451 452 453 454000mE 455
4025 4024 4023 4022000mN 4021 4020 4019 4018 4017 4016 4015 4014 4013 4012000mN



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 CUMBERLAND CITY
4		5	2 NEEDMORE
6	7	8	3 PALMYRA
			4 ERIN
			5 SLAYDEN
			6 WOOLWORTH
			7 RUSKIN
			8 VANLEER

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ELLIS MILLS, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
SLAYDEN QUADRANGLE
SHEET NUMBER 2 OF 16

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 NEEDMORE
2 PALMYRA
3 EXCELL
4 ELLIS MILLS
5 CUMBERLAND FURNACE
6 RUSKIN
7 VANLEER
8 CHARLOTTE

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SLAYDEN, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
CUMBERLAND FURNACE QUADRANGLE
SHEET NUMBER 3 OF 16

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 PALMYRA 2 EXCELL 3 HENRIETTA
4		5	4 SLAYDEN 5 CHEATHAM DAM
6	7	8	6 VANLEER 7 CHARLOTTE 8 HARPETH VALLEY

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CUMBERLAND FURNACE, TENNESSEE

7.5 MINUTE SERIES
SHEET NUMBER 3 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
CHEATHAM DAM QUADRANGLE
SHEET NUMBER 4 OF 16

87°15'00" 478 000m E 479 480 481 87°12'30" 482 483 484 87°10'00" 486 487 488 000m E 87°07'30"

36°22'30" 4025 4024 4023 4022 000m N 4021 36°20'00" 4020 4019 4018 4017 36°17'30" 4016 4015 4014 4013 4012 000m N 36°15'00"

CHEATHAM COUNTY
CUMBERLAND RIVER
CHEATHAM COUNTY LAKE
PARDUE POND WILDLIFE REFUGE
CHEATHAM COUNTY
HARPETH RIDGE
HARPETH WATERFOWL MANAGEMENT AREA
CHEATHAM COUNTY
Belsburg
Jackson Chapel
Hands Branch
Johnson Creek
Buck Branch
Locust Branch
Johnson Creek
Lower Twin Branch
Upper Twin Branch
Jackie Branch
Johnson Branch

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1 KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 MILES

1	2	3	1 EXCELL 2 HENRIETTA 3 PLEASANT VIEW
4		5	4 CUMBERLAND FURNACE 5 ASHLAND CITY 6 CHARLOTTE
6	7	8	7 HARPETH VALLEY 8 LILLAMAY

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CHEATHAM DAM, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
RUSKIN QUADRANGLE
SHEET NUMBER 5 OF 16

87°37'30" 87°35'00" 87°32'30" 87°30'00"
36°15'00" 36°12'30" 36°10'00" 36°07'30"

HOUSTON COUNTY
HUMPHREYS COUNTY

Edgewood
Adams Crossroads
Jewel Cave
Ruskin

Childress Branch
Bear Creek
Baldhop Creek
Hunt Branch
Yellow Branch
Cedar Branch
East Fork Yellow Branch
Dodd Creek

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 ERIN
4		5	2 ELLIS MILLS
6	7	8	3 SLAYDEN
			4 WOOLWORTH
			5 VANLEER
			6 MCEWEN
			7 TENNESSEE CITY
			8 DICKSON

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RUSKIN, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
VANLEER QUADRANGLE
SHEET NUMBER 6 OF 16

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 ELLIS MILLS
2 SLAYDEN
3 CUMBERLAND FURNACE
4 RUSKIN
5 CHARLOTTE
6 TENNESSEE CITY
7 DICKSON
8 BURNS

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VANLEER, TENNESSEE
7.5 MINUTE SERIES
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DICKSON COUNTY, TENNESSEE NO. 6

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
CHARLOTTE QUADRANGLE
SHEET NUMBER 7 OF 16

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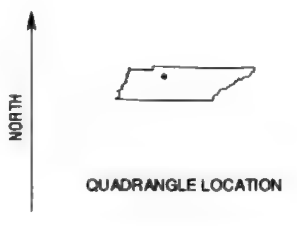
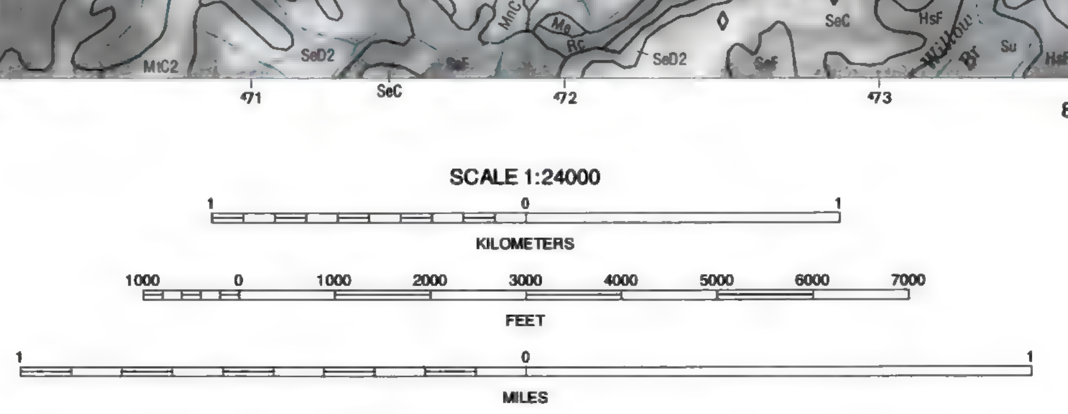
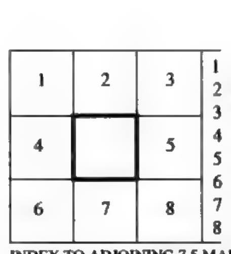
North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:24000





1 SLAYDEN
2 CUMBERLAND FURNACE
3 CHEATHAM DAM
4 VANLEER
5 HARPETH VALLEY
6 DICKSON
7 BURNS
8 WHITE BLUFF

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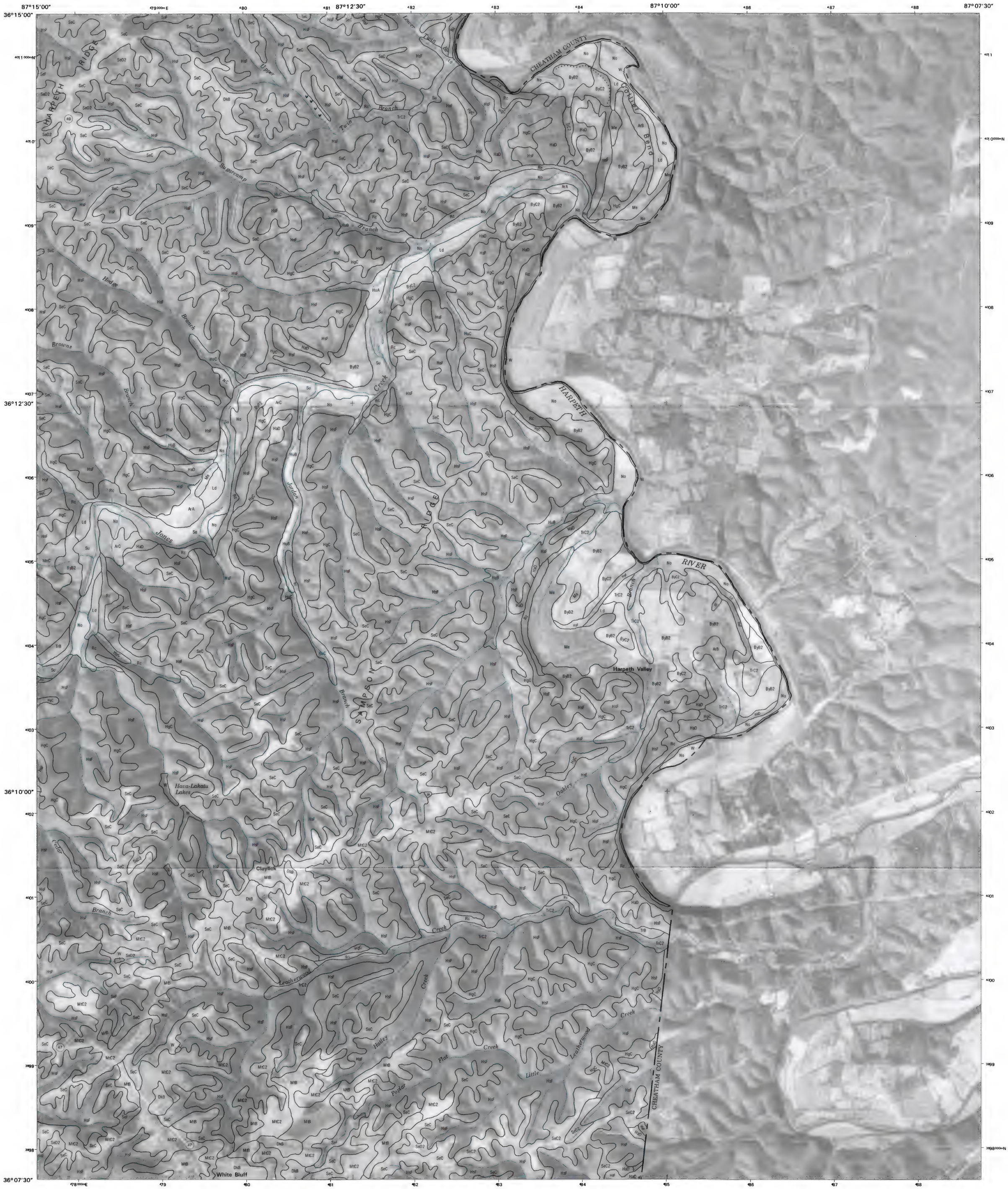
CHARLOTTE, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
HARPETH VALLEY QUADRANGLE
SHEET NUMBER 8 OF 16



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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 CUMBERLAND FURNACE 2 CHEATHAM DAM 3 ASHLAND CITY 4 CHARLOTTE 5 LILLAMAY 6 BURNS 7 WHITE BLUFF 8 KINGSTON SPRINGS
4		5	
6	7	8	

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HARPETH VALLEY, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
TENNESSEE CITY QUADRANGLE
SHEET NUMBER 9 OF 16

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 WOOLWORTH 2 RUSKIN 3 VANLEER
4		5	4 MCEWEN 5 DICKSON
6	7	8	6 BUCKSNORT 7 SPOT 8 TEXAS HOLLOW

INDEX TO ADJOINING 7.5 MAPS

TENNESSEE CITY, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 9 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
DICKSON QUADRANGLE
SHEET NUMBER 10 OF 16

87°30'00" 87°27'30" 87°25'00" 87°22'30"
36°07'30" 36°05'00" 36°02'30" 36°00'00"

Donegan Crossing
Pond
Dickson
Oak Grove
TENNESSEE VALLEY DIVIDE
Yellow Creek
Walnut Grove Spring
Rannie Branch
Martin Branch
Jones Creek
Garner Creek
Piney River
West Piney River
East Piney River
Coon Creek
Dogwood Spring
Fielder Branch
Worley Branch
Furnace Branch
Baker Branch
Bruce Spring
Reeder Creek
Grab Branch
Wiley Branch
Willow Branch
Turkey Creek

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North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3
4		5
6	7	8

1 RUSKIN
2 VANLEER
3 CHARLOTTE
4 TENNESSEE CITY
5 BURNS
6 SPOT
7 TEXAS HOLLOW
8 LYLES

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DICKSON, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
BURNS QUADRANGLE
SHEET NUMBER 11 OF16

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 VANLEER 2 CHARLOTTE 3 HARPETH VALLEY
4		5	4 DICKSON 5 WHITE BLUFF 6 TEXAS HOLLOW
6	7	8	7 LYLES 8 CRAIGFIELD

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BURNS, TENNESSEE
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SHEET NUMBER 11 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
WHITE BLUFF QUADRANGLE
SHEET NUMBER 12 OF 16

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

1	2	3	1 CHARLOTTE 2 HARPETH VALLEY 3 LILLAMAY
4		5	4 BURNS 5 KINGSTON SPRINGS 6 LYLES
6	7	8	7 CRAIGFIELD 8 FAIRVIEW

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WHITE BLUFF, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 12 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
SPOT QUADRANGLE
SHEET NUMBER 13 OF 16

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 MCEWEN 2 TENNESSEE CITY 3 DICKSON 4 BUCKSNORT 5 TEXAS HOLLOW 6 COBLE 7 WHITFIELD 8 CENTERVILLE
4		5	
6	7	8	

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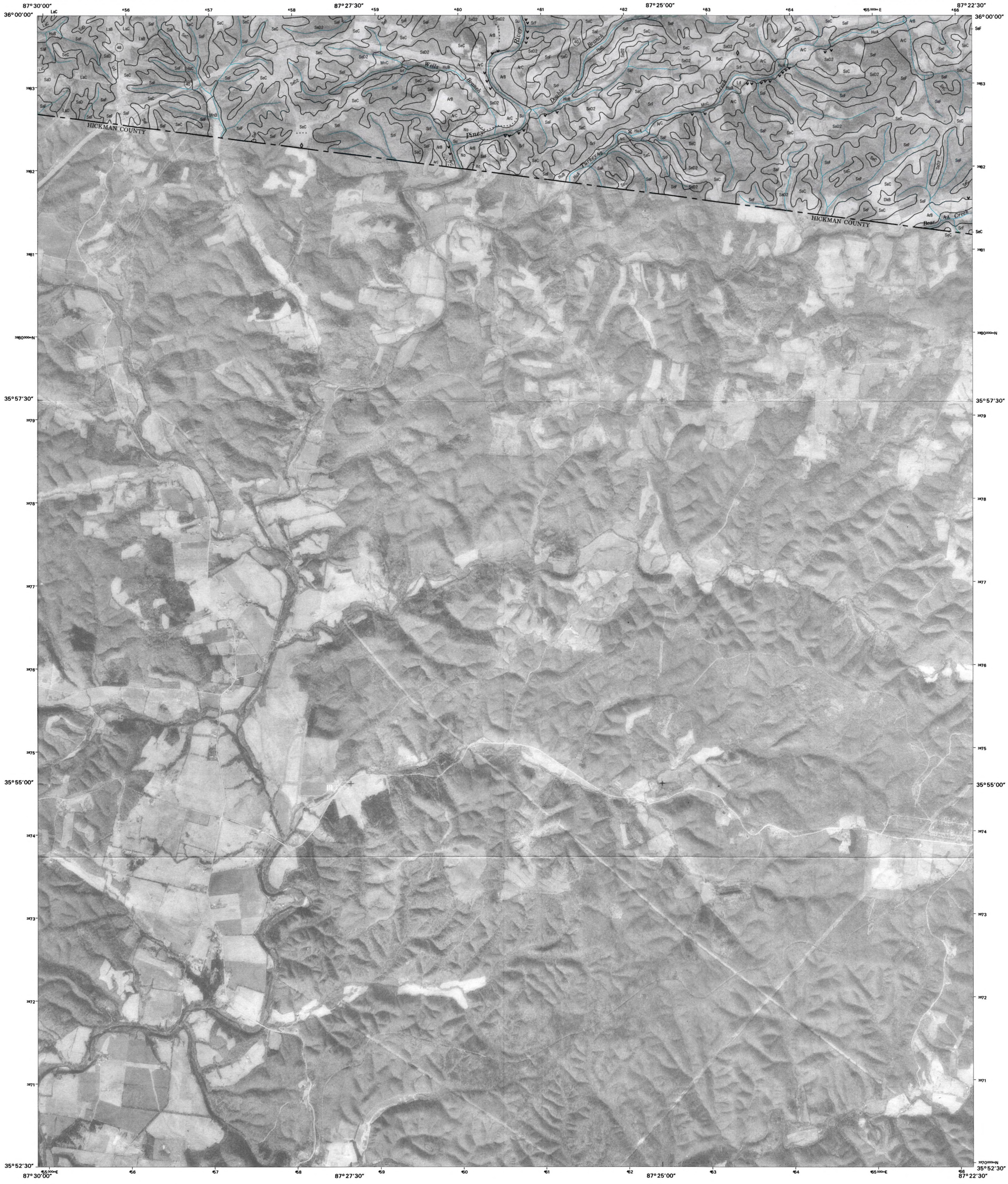
SHEET NUMBER 13 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
TEXAS HOLLOW QUADRANGLE
SHEET NUMBER 14 OF 16



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

1	2	3	1 TENNESSEE CITY 2 DICKSON 3 BURNS 4 SPOT 5 LYLES 6 WHITFIELD 7 CENTERVILLE 8
4		5	
6	7	8	

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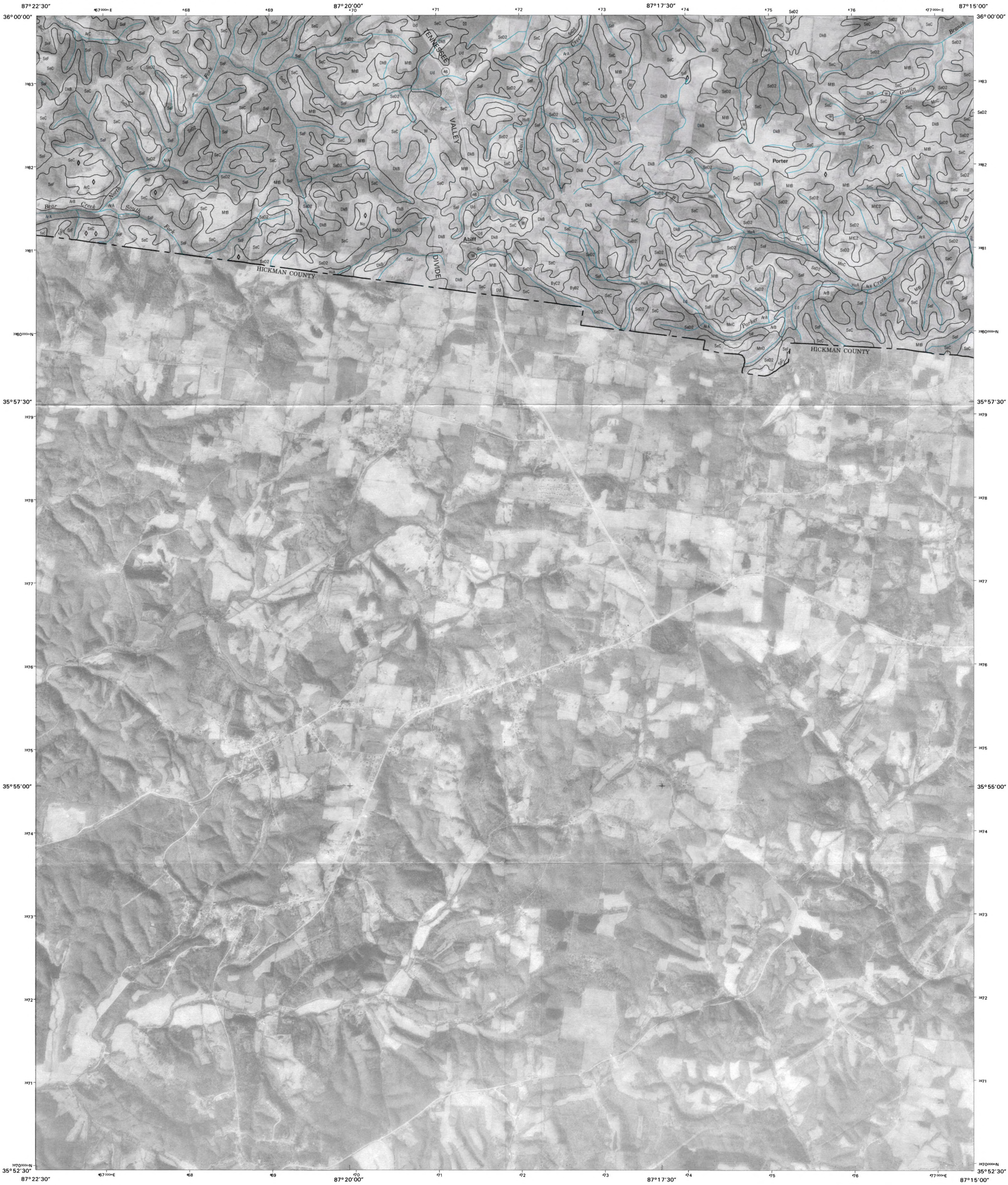
SHEET NUMBER 14 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
LYLES QUADRANGLE
SHEET NUMBER 15 OF 16



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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 DICKSON 2 BURNS 3 WHITE BLUFF
4		5	4 TEXAS HOLLOW 5 CRAIGFIELD
6	7	8	6 CENTERVILLE 7 LITTLELOT 8 PRIMM SPRINGS

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LYLES, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 15 OF 16

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DICKSON COUNTY, TENNESSEE
CRAIGFIELD QUADRANGLE
SHEET NUMBER 16 OF 16

87°15'00" 87°12'30" 87°10'00" 87°07'30"
36°00'00" 35°57'30" 35°55'00" 35°52'30"
478000m E 479 480 481 482 483 484 485 486 487 488000m E
3983 3982 3981 3980000mN 3979 3978 3977 3976 3975 3974 3973 3972 3971 3970000mN

Spencers Mill
Parker Creek
Big Creek
Turnbull Creek
Rids Branch
WILLIAMSON COUNTY
HICKMAN COUNTY
WILLIAMSON COUNTY
HICKMAN COUNTY

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NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 BURNS 2 WHITE BLUFF 3 KINGSTON SPRINGS
4		5	4 LYLES 5 FAIRVIEW
6	7	8	6 LITTLELOT 7 PRIMM SPRINGS 8 THETA

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7.5 MINUTE SERIES
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